



Vít Bojňanský  
Agáta Fargašová

# Atlas of Seeds and Fruits of Central and East-European Flora

The Carpathian Mountains Region

 Springer

# **ATLAS OF SEEDS AND FRUITS OF CENTRAL AND EAST-EUROPEAN FLORA**



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## The Carpathian Mountains Region

Vít Bojňanský, Agáta Fargašová

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## I AUTHORS

**Assoc. Prof. Vít Bojňanský, DSc.** holds degrees from Slovak Technical University in Bratislava, Slovak Republic and Charles University in Prague, Czech Republic. At the beginning of his scientific career he supervised the effort to control potato beetles (*Leptinotarsa decemlineata*) and other quarantine pests and pathogens, he organized a plant sanitary service and further supervised further education and training in plant medicine. From 1956 to 1958 he was the director of the Botanic Garden, SAS in Košice and then he served as a head of department and deputy director at the Institute of Experimental Phytopathology and Entomology, SAS, in Ivanka pri Dunaji, near Bratislava. He devoted himself to plant phytopathology and virology. He participated in organizing various activities related to plant protection and since 1998 he has devoted his efforts to the areas of plant protection and plant medicine. He also acted as a professor in plant protection and botany at the Slovak University of Agriculture in Nitra and Faculty of Natural Sciences, Comenius University in Bratislava for many years.

He took part in several long-term educational residencies abroad, including his residency at the Research Institute of Tropical Agriculture in Cuba (1965); scientific lecture tours in the universities and research institutes dealing with phytopathology in India and Sri Lanka; he served as a visiting professor at the University of Missouri, USA (1969-1970); emeritus professor and a head of the Department of Biology at the University of Makurdi in Nigeria (1983-1987) – during this stay he laid the foundation of a herbarium of flora of the state of Benue and directed the projects of building parks in the university complex and founded a botanic garden with a gene bank.

He was actively involved in the activities of numerous scientific societies, and he is the author of numerous publications, including 31 monographs, roughly 173 scientific works and over 360 scientific articles for the general public. After his retirement in 1991, he returned to his personal interest and concentrated on plant seeds. He started collecting the seeds from the Carpathian Mountains as a student of Secondary school in 1937. By 1991, his private collection represented approximately 3,000 species and together with the second author he broadened the program to include invasion plants intentionally cultivated and grown as a weed or ornamental plants in the Carpathian territory. After establishing a relation with various botanical gardens throughout Europe and inclusive of all continents, his collection over an 11 year period expanded to exceed 6,000 species. It was during these years that he handled more than 70,000 samples. From this huge collection, the author himself illustrated and described about 4,800 species, which are included in the current publication.

**Prof. Agáta Fargašová, DSc.** has been Head of the Department of Ecosozology and Physiotactics at the Faculty of Natural Sciences in Comenius University in Bratislava since 2002. She holds degrees from Comenius University in Bratislava, Slovak Republic (Biology – Genetics; PhD. – Microbiology), Slovak University of Agriculture in Nitra, Slovak Republic (Assoc. Prof. – Plant Protection) and Palacky Univerzity in Olomouc, Czech Republic (Prof. – Ecology). In 2001 she was awarded a DSc. degree in Environmental Sciences. From 1975 to 2002 she was an associate professor at the Department of Environmental Sciences, Faculty of Chemical and Food Technology, Slovak Technical University in Bratislava, where she taught Toxicology, Microbiology, Ecology, Ecotoxicology, Biology of Water, Soil and Air, and Pedology and Meteorology. At present, she teaches Ecology, Ecotoxicology and Environmental Risk Assessment for students of specializations Environment, Nature and Landscape Protection and Environmental Chemistry at the Faculty of Natural Sciences in Bratislava. Her research work included Genetics of Fungi, Microbiology and Hydrobiology and since 1989 she has been working primarily in the area of Ecotoxicology, as well as the areas of Environmental Protection and Environmental Risk Assessment.

She took part in several long-term studies and educational residencies abroad, including the Institute of Microbiology, ASCZ in Prague, Czech Republic; Attila József University in Szeged, Hungary; Technical University in Vienna, Austria; Pasteur Institute in Paris, France; University of Agriculture in Cracow, Poland; GSF Institute in Munich, Germany, Hokkaido University in Sapporo, Japan - course in Environmental Management for Eastern European Countries, and others.

As an author of scientific works, she has published articles for a variety of scientific journals and proceedings (more than 200 scientific articles), she co-authored 4 monographs and 3 text books for university students. As a member of various scientific societies she actively participates in organizing conferences focusing on Industrial Toxicology, Environmental Risk Assessment and Metals in the Environment. Together with her father, Prof. Bojňanský, she has a keen interest in nature and botany.

## II PREFACE

Carpathian Mountains – a major mountain system in Europe are a crescent-shaped mountain range in east-central Europe, extending approximately 1,450 km in a system of parallel structural ranges eastward from the Danube Gap near Bratislava in Slovakia, southward to Brasov in Romania, and south-eastward to a part of the Danube Valley, called the Iron Gate near Orșova in Romania. The Carpathians cover the area of 209,256 square km and this makes them nearly five times the size of Switzerland and larger in area than Europe's Alps. Although commonly referred to as a mountain chain, the Carpathians do not actually form an uninterrupted chain of mountains. Rather, they consist of several orographically and geologically distinctive groups, presenting as great a structural variety as the Alps. The Carpathians, which only in few places attain an altitude of over 2,500 m, lack the bold peaks, extensive snow-fields, large glaciers, high waterfalls and the numerous large lakes which are common in the Alps. No area of the Carpathian Range is covered in snow year-round, and there are no glaciers. The Carpathians at their highest altitude are only as high as the Middle Region of the Alps, with which they share a common appearance, climate, and flora.

The Carpathians are separated from the Alps by the Danube and spread over the parts of western territories of Moravia in the Czech Republic, Slovakia, Poland, Hungary, Romania, Moldavia, the Ukraine and Belorussia, and from the eastward continuation of the Alps. The Carpathians differ considerably from the Alps; their structure is less compact, summits are lower, and they are split up into a number of mountain blocks separated by basins. The highest elevation (Mount Gerlach), is situated in Slovakia, and reaches the height of 2,655 m a. s. l. Water runoff from the Carpathians escapes for its most part into the Black Sea through the rivers Danube and Dnester. From the northern slopes and the large Big Poland Lowland it flows through the Visla River into the Baltic Sea.

The native flora of the Carpathian Mountains and lowlands is rich and involves about 6,000 species, with introduced and invading flora it counts more than 7,500 species. The Carpathian flora occurs not only in the Carpathian Mountains, but also in large lowlands extending toward the south, north and east.

Different vegetation stages may also be distinguished for the various altitudinal zones of the Carpathians. The alpine stage is characterized by high mountain pastures, the subalpine stage by dwarf pine growth, the upper forest stage by spruce, and the lower forest stage by beech. The foreland stage is noted for oaks and elms. The natural vegetation stages are matched by stages of economic land use: the foreland by wheat and potato growing, the lower forest stage by oats and potato growing (up to 1,000 m), and the upper forest stage and the subalpine stages by pastoral use.

The plant life of the Carpathians contains many unique species, especially in the southeastern part of the mountains where the effect of Quaternary climatic cooling was less marked. Forests have been best preserved in the eastern part of the Carpathians. The vegetation of the Ukrainian Carpathians belongs to the Central European province. Except for that of the Low Beskyd, the flora here is much richer than in the Western Carpathians and includes many Balkan and Transylvanian species and a number of endemic forms. At one time all the Carpathians were covered with forest and topped with meadows and rock fields. Even today about one-half of the region is forested. All the mountain vegetation belts are represented in the Ukrainian Carpathians.

The lowest belt, up to an altitude of 500–600 m, consists of deciduous and mixed forests, which contain mostly oak and some hornbeam, maple, linden, elm, birch, and pine. In Transcarpathia, up to an altitude of 400 m, there are also some warm-climate species such as the chestnut and walnut. This belt has been modified by humans more than any other, and today the forests form only small islands among the farmlands.

Above 500–600 m lies the belt of mountain forests. In Transcarpathia (apart from its northeastern and eastern parts) and in the upper Sian River basin beech forests occur exclusively; in other parts



of the Ukrainian Carpathians mixed and coniferous forests predominate. Some oak is found at the lower levels of the beech forests, as well as maple, birch, and ash. The undergrowth includes elder, mezereum, raspberry, currant, honeysuckle, and willow. Grass cover is rare. The upper limit of the beech forests is rather well defined at 1,100–1,200 m. Above 1,000 m the beech trees are somewhat shorter.



Other mountain forests in the Carpathians form two belts: a lower, mixed belt, which reaches an altitude of 900–1,200 m and consists mostly of beech, spruce, and fir, with an undergrowth similar to that of the beech forests; and a higher, spruce belt, with an admixture of fir, pine, larch, cembra pine, and ash. The grasses are poorly developed. The upper limit of the forests is 1,450–1,600 m. This zone is a transitional belt, about 100 m wide, consisting of individual trees, brush, and meadow.

Above the forests runs a belt of highland pastures – meadows and brush with subalpine (up to 1,750–1,850 m) and alpine vegetation. The typical plants of the subalpine belt are mugho pine, green alder, rhododendron (*Rhododendron kotschyi*), and dwarf juniper (*Juniperus nana*), which often form a large, hardly penetrable brush, particularly in the Gorgany Mountains and the Maramureş-Bukovynian Upland.

Grasslands cover all the higher ridges except the Gorgany. In the beech-forest belt they completely cover the ridges above 1,100–1,200 m, while in the pine-forest belt their lower limit is 100–150 m higher and they are partly taken over by brush, mainly by dwarf pines. In the Gorgany Mountains meadows are rare. By lowering the upper boundary of the forests, humans have increased the area of grasslands, but excessive pasturing has reduced the variety of plant forms. The mountain meadows are overgrown with sedge (*Carex curvula*, *C. rupestris*), hard rush (*Juncus trifidus*), sheep fescue (*Festuca ovina*), and small reed (*Calamagrostis*). Low-quality grasses such as matgrass (*Nardus stricta*) and tufted hairgrass (*Deschampsia caespitosa*) predominate to an altitude of 1,500–1,600 m, while such

valuable grasses as common meadow grass (*Poa pratensis*) and white dutch clover (*Trifolium repens*) are rare. In general, the variety of plants growing in the meadows increases towards the east. The variety is greatest on chalky soils.

Morphological characteristic of seeds, however, have not been paid much attention by the taxonomists till now. In floras and botanical works they have generally been treated very briefly, if mentioned at all. This fact is even more surprising, because of the fact that the seed morphology is very stable and only little affected by external influences. The morphological characteristics are usually constant and therefore of great value to the process of determining the systematic units. This is nowadays frequently emphasized in modern manuals of systematic botany. Research has shown that a well-developed seed can in general be classified with respect to its relevant genus and species and, in exceptional cases, also to subspecies or even hybrids. In all botanical publications worldwide, the seed phenomena are not sufficiently used in descriptions of the relevant plant species, despite the fact that it are the seeds that are most important for the species existence. Till now there have existed botanical publications that included mainly photographs or pen-drawings without any descriptions of the seeds. Authors of this publication, with their artistic presentation have rendered to the readers visual notions and descriptions at the same time.

In order to meet increasing requirements and also time to promote and stimulate continuous development in this area of research, the present atlas of seeds has been supplemented with morphological descriptions and includes seeds of altogether nearly 4,800 species. The species of seeds described therein are those which are native, introduced and hauling into or cultivated in fields, gardens, rock-gardens, woods, parks, town verdure, hedges, departments, vicinities of buildings etc., situated in the Carpathians region. The material thus used has been gathered by the authors of the present publication in course of many years (1941–1990) to some extent directly in the Carpathians natural area, or it was acquired from many foreign botanical gardens and other related institutes. The authors have gathered in their seed collection about 6,000 species of the Carpathians flora. Probably 18–20 % of the seed species are to be considered as dubiously determinated. For this reason seeds such these have not been used in the present publication.

The seed drawings were made by the first author himself. The present atlas also includes an index of all seed species described therein, arranged in alphabetical order according to their Latin names.

### III ACKNOWLEDGMENTS

Having completed this work we would like to express our most sincere thanks mainly to RNDr. J. Bella, PhD., director of the Botanical Garden of the Comenius University in Bratislava, and to his fellow-workers: RNDr. T. Králik, PhD., RNDr. A. Petřík and Mrs. V. Kružeková for their multilateral direct as well as indirect cooperation with many botanical gardens throughout the world. Our thanks also go to the director of the Botanical Institute of the Slovak Academy of Sciences, RNDr. I. Jarolímek, PhD., and his staff, especially to RNDr. Š. Maglocký, PhD. and RNDr. P. Mered'a, PhD.

Successful completion of this book was greatly facilitated by the assistance of two young men, Michal Faix and Ing. Vít Fargaš. Michal Faix helped us to transfer all text in computer form and assisted with the major revisions of our book. To Vít Fargaš we would like to express our special thanks for transformation of all pen-drawings into computer form, their cleaning and final arrangement. Without their work, this book could not have been published. We must also thank the thoughtful people from the Department of Ecosozology and Physiotactics, at the Faculty of Natural Sciences, Comenius University in Bratislava who dedicated valuable time to help us during finalization of the book.

We are also indebted to Dr. Lenka Moravcová, PhD. and Prof. Milan Križo, DSc., manuscript reviews, who provided helpful and constructive criticism on this book and so we are very thankful for their comments which help us to improve the text and find errors in logic as well as typos that invariably sneak in.

We appreciate the encouragement, and support from our family members, mainly my wife Hilda, who many years tolerated work on this book.

Last but not least, we also would like to express our gratitude to the directors of all Botanical Gardens, mentioned in the particular Register of the Botanical Gardens, exploited in the years 1990–2003 for extending, completing and reviding our collections which were gathered in the period 1941–1990 in the Carpathians region. The above mentioned Botanical Gardens have provided us throughout the introduced years with more than 70,000 specimens.

Vít Bojňanský  
Agáta Fargašová

## IV EXPLANATORY NOTES ON THE TEXT

### *SIGNS AND ABBREVIATIONS*

c.	circa, approximately
cm	centimeter(s)
cv., cvs	cultivar(s)
convar.	convarieta(s)
diam.	diameter
draw.	drawing(s)
em.	emended
enl.	enlargement
m	meter(s)
mm	millimeter(s)
2n	the somatic chromosome number
±	more or less
pp.	pages
p.p.	pro parte
sp.	species, plural spp.
syn.	synonym
var.	variety
Vols	volumes
x	hybrid

### *ABBREVIATION OF GEOGRAPHICAL TERRITORIES*

Au	Austria	Pl	Poland
Br	Belorussia	Ro	Romania
Hu	Hungary	Sk	Slovakia
Cz	Czech Republic	Uk	Ukraine
Mo	Moldavia		

### *ABBREVIATIONS IN BOTANICAL GARDENS REGISTER*

Acad.	Academy	Mount.	Mountain
Agrobot.	Agrobotanic(al)	Natur.	Natural
Agron.	Agronomic(al)	Path.	Pathology
Agric.	Agricultural	Pharm.	Pharmaceutical
Arb.	Arboretum	Plant.	Plantarum
B.G.	Botanic(al) Garden(s)	Res.	Research
Bot.	Botanic(al)	Sci.	Sciences
Centr.	Central	Silvitechn.	Silvitechnology
Collec.	Collection	Slov.	Slovakian
Cult.	Cultural	Soc.	Society
Dep.	Department	Stat.	Station
Ecol.	Ecological	Subtrop.	Subtropical
Exper.	Experimental	Super.	Superior

Fac.	Faculty	Techn.	Technology
Hort.	Horticultural	Trop.	Tropical
Hung.	Hungarian	Univ.	University
Inst.	Institute	Veget.	Vegetation
Labor.	Laboratory	Zool.	Zoological
Medic.	Medic(inal)		

## V REGISTER OF THE EXPLOITED BOTANICAL GARDENS (1900–2003)

**Algeria:** B.G. du Hamma, *El-Naseer*.

**Argentina:** B.G. Fac. Agron., *Azul*; B.G.R. Ruiz, *Buenos Aires*; B.G. and Arb., *La Plata*.

**Austria:** B.G. Univ., *Graz*; B.G. and Arb., *Linz*; B.G. *Klagenfurt*; B.G. Univ., *Innsbruck*; B.G. Univ., *Salzburg*; B.G. Univ. Bodenkult., *Wien*; B.G. Univ. Vienna, *Wien*; Alpengarten Belvedere, *Wien*.

**Azerbaijan:** B.G. Centr. Acad. Sci., *Baku*.

**Belorussia:** Centr. B.G. Acad. Sci., *Minsk*.

**Belgium:** B.G. *Antwerpen*; Arb. Hof Saksen, *Beveren*; Jardin J. Massart Univ., *Bruxelles*; Plant Univ., *Gent*; Arb., *Kalmnout*; B.G. Lovaniensis, *Leuven*; B.G. Univ., *Liege*; Natur. B.G. Belgium, *Meise*; Arb. Waasland, *Nieuwkerken*.

**Bulgaria:** B.G. Univ., *Balchik*; B.G. Univ., *Sofia*; B.G. Acad. Sci., *Sofia*; B.G. Inst. Silvitechn., *Sofia*.

**Canada:** Devonian B.G. Univ., *Edmonton*; Rocky Mount. Seed Serv., *Golden*; B.G. Montreal, *Montreal*; Niagara Park B.G., *Niagara Falls*; Bot. Dep. Univ. Guelph, *Ontario*; Metro Toronto Zoo, *Ontario*; Toronto Zoo, *Scarborough*; Glendon Hall Labor. and Garden, *Toronto*; Dep. Bot. Univ., *Toronto*; B.G. Univ., *Vancouver*.

**China:** B.G. Pekin. Acad. Sinic., *Xiangshan*; Nanjing B.G., *Nanjing*.

**Croatia:** Arb. Acad. Sci., *Trsteno*; B.G. Univ., *Zagreb*.

**Czech Republic:** B.G. J. Svoboda, *Benátky nad Jizerou*; Arboretum, *Bíla Lhota*; Arb. Forest Fac., *Brno*; Exper. G. Medic. Plant, *Brno*; B.G. Univ., *Brno*; Central G. Fac. Medic., *Brno*; B.G. Arb. Univ. Agric., *Brno*; B.G. Medic. Univ., *Hradec Králové*; Arb. Kostelec, *Kostelec*; State Park Lednice, *Lednice*; B.G. Liberec, *Liberec*; B.G. Palacký Univ., *Olomouc*; Arb. Nový Dvůr, *Opava*; Arb. Forest Techn. School, *Písek*; City Zool. and Bot. G., *Plzeň*; B.G. Park Cult. and Leisure, *Plzeň*; B.G. Univ. Carolinae, *Praha*; Zool. G., *Praha-Troja*; Inst. Trop. and Subtrop. Agric., *Praha*; Prague B.G., *Praha*; B.G. Prostějov, *Prostějov*, Succul. Plant. Collec. Univ., *Prostějov*; Inst. Bot. Acad. Sci., *Průhonice*; Res. Inst. Orn. Gard., *Průhonice*; B.G. Middle Agric. Techn. School, *Rakovník*; B.G. Agric. School, *Tábor*; B.G. Town Teplice, *Teplice*.

**Denmark:** B.G. Aarhus, *Aarhus*; B.G. Natur. Fac., *Aarhus*; Univ. B.G., *Kopenhagen*; Bot. Inst., *Risskov*; Arb. Paludosum; *Silkeborg*.

**Estonia:** B.G. Tallin, *Tallin*; B.G. Tartu Univ., *Tartu*.

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## VI GLOSSARY

- Abaxial** – that surface of any structure which is remote or turned away from the axis
- Acorn** – a nut partially surrounded by a fibrous or woody cap (involucre) (oak)
- Achene** – single-seeded dry indehiscent thin-walled fruit in which the seed coat is not part of the fruit coat
- Acuminate** – tapering gradually to a sharp point and forming more or less concave sides; drawn out into a long point
- Aculeate** – bristly with small pointed projections
- Acute** – pointed, but not tapering; sharp at the end; ending in a sharp point
- Adpressed** – pressed flat to the axis
- Alveolate** – with depressions (lumina) and walls (muri) giving the appearance of a honeycomb or windows; lumina and muri composed of transparent parenchymous tissue; honey-combed, the elevation not rounded off, the depression or area outlined by the elevation
- Annual** – completing its life cycle in the course of a year
- Annulate** – ringed by circumferential grooves or ridges
- Apex** – tip, point, vertex; the point farthest from the point of attachment
- Apical** – at the tip or summit (opposite of basal – at the base); forming a point
- Apiculate** – ending in a short, sharp point; terminated abruptly by a small, distinct point, an apiculus or apicule
- Appressed** – lying flat or close against the surface; often used for hairs
- Areolate** – marked off into little rounded areas by fine lines
- Aril** – an outer covering or appendage surrounding the seed, arising at or near the point at which it is attached to the branch; a fleshy secondary covering over the seeds of some gymnosperms; an additional covering that forms on some seeds after fertilization, and developing from the stalk of the ovule
- Aristate** – tipped with a beard or awn; awned; having an awn
- Ascending** – rising or curving upward
- Attenuate** – gradually narrowed to a long point at apex or base
- Awn** – the apical bristle on the bracts that envelop the inflorescences of the Gramineae- grasses; awn is an extension of the vein or mid-rib of the lemma; also called arista or beard; those in which no awn is present are referred to as **awnless**; those in which a very prominent awn is evident are referred to as **awned**; those which have a very small awn are referred to as **awnletted**
- Awned** – with one or a few long sharp projections
- Axis** – a straight line through the center of a structure around which the parts are usually symmetrically arranged (geom.); the main stem (bot.)
- Basal** – at the base (opposite of apical)
- Beak** – a prominent terminal projection, especially of a carpel or fruit
- Beaked** – with a prolonged slender projection, not sharp
- Bearded** – equipped with an awn, beard or arista
- Biennial** – completing its life cycle in the course of two years
- Bilateral** – having two sides
- Boat-shaped** – the seed is elongated and strongly keeled dorsally with an large, conspicuous hilum in the middle of the flat underside; the edges may be flanged or narrowly winged
- Bract** – a leaf-like structure, different in form from the foliage leaves and without an axillary bud, associated with an inflorescence or flower
- Bracteole** – a small bract-like structure borne singly or in pairs on the pedicel or calyx of a flower

- Bristle** – stiff, strong but slender hair or trichome; a stiff hair or hair-like structure; a rigid trichome similar to a pig's bristle
- Bulb** – a storage organ, usually underground, made up of a stem and leaf bases, the food reserves being stored in the inner, fleshy leaf bases
- Bulbil** – a small, deciduous bulb (or tuber) formed in the axil of a leaf or replacing flowers in an inflorescence, and functioning to propagate the plant vegetatively
- Calyx** – a collective name for the outer whorl of the flower formed by leaf-like petals known as sepals and which are usually green; the covering of the bud, before the flower opens
- Campanulate** – bell shaped
- Cancellate** – latticed, or resembling a latticed construction, usually said of a surface such as that of an achene or seed
- Capitate** – enlarged or swollen at tip, gathered into a mass at apex, as compound stigma; a knoblike stigma terminating a style
- Capsula** – is the most common fruit type; is a dry fruit which splits open to release the seeds; it develops from a compound pistil (coenocarp, gynoecium), the pericarp is dry, dehiscent into the locules or between them, usually many seeded
- Carina** – a longitudinal ridge; part of the flower of legumes
- Carinate** – shaped like the keel of a ship; having a longitudinal prominence on the back, like a keel
- Carpel** – leaf-like megasporophyll bearing one or more ovules on the inner surface; carpels are innermost parts of a complete flower and they are united to form the gynoecium (pistil); a component of the gynoecium that encloses the ovules and bears the stigma; fruit (schizocarp) section bearing seed with its own slender style (hook) (*Erodium* species)
- Caruncle** – an appendage near the hilum of some seeds
- Caryopsis** – is a simple dry indehiscent fruit, like an achene, but with the seed coat fused with the fruit coat (pericarp); a small achene in which the pericarp is fused to the seed; popularly called grain
- Castaneous** – relating to or having the color of a chestnut
- Catoclesium** – fruitlets covered by leaves, bracts or perianth
- Caudate** – tapering to a long, tail-like appendage
- Cellular Reticulate** – net-like, with reticulum walls corresponding to cell walls (see reticulate)
- Chalaza** – basal part of a plant ovule opposite the micropyle; where integument and nucellus are joined
- Chartaceous** – papery
- Ciliate** – with marginal hairs that form a fringe
- Clavate** – club shaped, elongated, narrowing toward the base and gradually thickened or expanded toward the apex
- Colliculose** – a negative reticulum, with “net” lines formed by depressions instead of projections, (*cf. reticulate*)
- Colliculate** – with rounded broad elevations closely spaced covering the seed-coat
- Coma** – a tuft of soft hairs, as at the apices or bases of seeds; a bunch of branches; a terminal cluster of bracts on a flowering stem, as in pineapples
- Compressed** – flattened; in grasses, used to denote compression (not necessarily flattened) either laterally or dorsiventrally
- Cone** – a conical structure consisting of stiff, overlapping, woody scales between which are the seeds (pines)
- Conic** – roughly cone-shaped
- Convex** – somewhat the shape of a half-circle, regularly rounded on top
- Cordate** – heart shaped; with a sinus and rounded lobes at the base, the overall outline usually ovate; often restricted to the base rather than to the outline of the entire organ

**Coriaceous** – leather-like

**Corolla** – collective term for all the petals of a flower

**Cotyledons** – embryonic leaf present in the seed; the first leaf or leaves of a seed plant, found in the embryo of the seed which may form the first photosynthetic leaves or may remain below ground; monocotyledon plants have one, dicotyledon plants have two, gymnosperm plants – several

**Crenate** – edged with shallow, rounded indentations; having a notched, indented, or scalloped edge

**Crown/Corona** – that part of a stem at or just below the surface of the ground; an inner appendage of a petal or the throat of a corolla; an appendage or extrusion standing between the corolla and stamens, or on the corolla

**Cuboid** – the seed is chunky, often with a smooth, shiny or somewhat granular, somewhat slightly rounded, dorsal side; the hilum is situated on a smaller terminal face separated from the dorsal side by the side walls of the seed; the walls are often angular; the chaff is usually similar to the seed, but somewhat smaller and lighter coloured

**Cuneate** – narrowly triangular with the acute angle toward the base; wedge-shaped; tapering toward the point of attachment

**Cuspidate** – having a sharp, rigid point at the apex; tipped with a short, rigid point

**Cylindrical** – having the shape of a cylinder

**Cypsela** – a single-seeded dry indehiscent fruit that develops from a one part inferior ovary (on the stalk side of the flower); they are sometimes included with achenes

**Cordate** – having a heart-shaped outline

**D-shaped** – the seed is roughly disc-like with a short straight side and a longer connecting curved side; the hilum is towards the narrowed end

**Dehiscent** – of fruits that open spontaneously on ripening to release the seeds

**Dentate** – with a sharply toothed margin; toothed; with large saw-like teeth on the margin pointing outward, not forward

**Denticulate** – having small teeth; finely dentate

**Depressed** – with the central part sunken below the level of the margin

**Discoid** – having the form of a disk

**Divergent** – separated from one another, having tips further apart than the bases

**Diverticulate** – having short offshoots approximately at right angles to axis

**Dorsal** – pertaining to the back; the surface turned away from the axis; the back of an organ; the side away from the axis; (compare **ventral**)

**Dorsiventral** – pertaining to the dorsal and ventral surfaces

**Down** – fine, soft feathers; soft, fine hair

**Downy** – covered with short, fine hairs

**Drupe** – single fleshy fruit with a hard stone which contains the single seed; a fleshy or pulpy fruit with the inner portion of the pericarp hard or stony and enclosing the seed; usually 1-locular and 1-seeded, sometimes more than 1-locular and more than 1-seeded

**Eccentric** – not attached in the center

**Echinate** – set with prickles; prickly, like a hedgehog; having sharp points

**Elaiosomes** – are fleshy structures that are attached to the seeds of many plant species

**Ellipsoid** – elliptical, with both ends similar (*cf.* **ovoid**); a solid with an elliptical outline

**Ellipsoidal with terminal wing** – the flattened-ellipsoidal body of the seed occurs at the lower end (considering the disposition of the ovule on the placenta in the intact bud), with a transparent wing as long as the body of the seed at the top end; the wings may be seen, just before seed shed, emerging from the top of the ovary; the hilum is usually positioned near one edge not far from the start of the wing; the wing is purely a descriptive morphological term and the structure has not apparent aerial function

- Elliptic** – having the outline of an ellipse (longer than broad with blunt or round ends); an outline that is oval, narrowed to rounded at the ends and widest at about the middle
- Elongate** – not globose, but this term does not specify a particular shape
- Endocarp** – hard inner layer of the pericarp of some fruits that contains the seed; the interior of the fruit wall; it may be membranous or woody; the inner layer of the wall of a matured ovary; when its texture differs from the outer wall, it may be hard and stony, membranous, or fleshy
- Epicarp** – the outermost layer of the fruit
- Exocarp** – the outer layer of the wall of a matured ovary
- Falcate** – curved like a sickle or new moon and tapering to a point
- Fasciculate** – growing in bundles
- Falsifoveate** – with pits that do not have the same depth throughout, as a little depression made laterally
- Favulariate** – with the surface finely ribbed, the ribs separated by zigzag furrows
- Fibrous** – having loose thread-like fibers
- Filiform** – thread-like, long and very slender
- Fimbriate** – cut into regular segments and appearing fringed at the margins
- Flabellate** – fan-shape
- Flattened** – the seed is somewhat flattened with a distinct upper (dorsal) and lower (ventral) side; the ventral side may be somewhat concave, with the hilum in the centre
- Floret** – the unit of a grass spikelet consisting of a flower or caryopsis, with lemma and palea; the lemma, floral axis, and palea with the included flower (pistil, stamen, and lodicules) or caryopsis (floret with all parts)
- Follicle** – is a dry dehiscent fruit which splits on one side only; it may contain one or many seeds; is regarded as the most primitive type of fruit and is common in the *Ranunculaceae* family; the fruit is composed of a single carpel
- Foveate** – pitted
- Foveolate** – marked with little pits
- Fruit** – are a uniquely angiosperm feature; part of the pollinated flower ripens and becomes the fruit; the developed ovary of the flower containing ripe seeds, whether fleshy or dry, often used to include other associated parts such as a fleshy receptacle, then called a false fruit
- Fruit size** – is the size to which the mature fruit may potentially develop
- Fruit color** – predominant colour appearance of the fruit on the plant when viewed from a distance, but not the slight variations which occasionally occur
- Fructification** – is a feature of angiosperms during which the seeds are encapsulated by the ovary
- Furrowed/Fissured** – having grooves, cracks, splits or narrow depressions, opposite of “ridged”
- Funiculus/Funicle** – the stalk of an ovule
- Fusiform** – shaped like a spindle; thick, tapering at both ends; spindle-shaped; broadest at the middle and tapering at both ends
- Geniculate** – bent like a knee; bent abruptly at the nodes
- Glabrate** – becoming glabrous with age
- Glabrous** – hairless; with a smooth, even surface; without hairs
- Glandular** – having or bearing secreting organs, glands, or trichomes
- Glandular-pubescent** – hairs or trichomes capitate and secretory
- Glaucous** – covered with a very fine layer of wax
- Glebulate** – with small clumps of irregularly placed granules
- Globose** – spherical or nearly so; rounded; almost spherical; globular
- Glomerate** – to gather or wind into a ball; growing, collected or arranged in a rounded mass, as glands, flowers, etc.; clustered
- Glossy** – shiny

- Glume** – one of a pair of dry bracts enclosing the base of each spikelet (of grasses)
- Graniculate** – with larger or irregularly placed granules
- Granular** – having a grainy surface
- Grooved** – with parallel elongated depressions, coarser than striate
- Hairy** – covered with hairs
- Hilum** – the scar on a seed marking its point of attachment to the funicle (the stalk that connects the seed to the ovary wall during development); the scar on a seed marking the place where it was attached to the seed stalk; funicular scar on seed coat
- Hirsute** – set with bristles; hairy; shaggy
- Hyaline** – of thin, membranous, transparent or translucent texture
- Hypocotyls** – portion of the embryonic axis below the cotyledons and above the radicle
- Indehiscent** – a fruit that does not drop its seeds spontaneously when they ripen
- Keel** – the folded edge or ridge of any structure
- Keeled** – with projecting elongate, sharply-angled ridges, like keel of a boat
- Lacerate** – with a jagged, irregular margin
- Lamellate** – made up of thin plates or lamina
- Lanate** – woolly, with long intertwined, curled hairs
- Lanceolate** – four to six times as long as wide, narrow and tapering at each end; shaped like a lance; broadest toward the base and narrowed to the apex, several times longer than wide
- Lateral** – of, at, or from the side; can refer to the sides adjacent to the dorsal and ventral side
- Legume or pod** – dry dehiscent fruit, from a simple pistil, dehiscent along two sutures
- Lemma** – is a bract that usually encloses or partially encloses a flower in the spikelet of the grasses; the lower (abaxial), and larger, of two membranous bracts enclosing the flower in grass
- Lenticular** – lens shaped; shaped like a double-convex lens
- Linear** – the seed is narrow and elongated, with a very small dorsal surface, long sides and terminal hilum; sides nearly parallel; long and slender with parallel or nearly parallel sides
- Lineate** – marked with fine lines
- Lineolate** – marked with fine broken lines
- Loment** – a fruit of some legumes, contracted between the seeds, the 1-seeded segments separating at fruit maturity
- Lunate** – crescent-shaped
- Lustrous** – semiglossy
- Marginal** – at, on, or close to the margin or border
- Membranous** – like a membrane; thin, soft and flexible, or pliant
- Mericarp** – one of the two carpels that resemble achenes and forms the schizocarp of an umbelliferous plant; one segment of a fruit that breaks at maturity into units derived from the individual carpels, (*cf.* **schizocarp**)
- Mucronate** – terminating with a short, sharp, abrupt tip
- Mucronulate** – diminutive of mucronate
- Muricate** – covered with very short spines; having a rough surface texture owing to small, sharp projections
- Nut** – a large single hardened achene; one seeded by abortion (only one ovule matures), usually hard-shelled; a hard-shelled dry fruit or seed having a more or less distinct separable rind or shell and interior kernel or meat; a dry indehiscent one-seeded fruit with a woody pericarp developing from an inferior syncarpous ovary
- Nutlet** – this is not a classification that seems to be recognized everywhere, but the family *Lamiaceae* has a particulate type of seed which is not quite any of the normal ones; the fruits of this family are single-seeded achene-like nutlets, which are held at the bottom of the calyx; a small nut

- Nutlike** – like a nut, but being a dry, single seeded fruit, which doesn't shed its seed when ripe; the term is often used loosely of any hard fruit
- Obclavate** – club shaped, but widest at the base; inversely clavate, (*cf.* **clavate**)
- Obconic** – not quite conical; cone-shaped, with attachment at or near the narrow end
- Obcordate** – heart-shaped, with attachment at or near the narrow end, (*cf.* **cordate**)
- Ob lanceolate** – broader and rounded at the apex, and tapering at the base; shaped like a lance point reversed; lance-shaped, with attachment at or near the narrow end
- Oblique** – slanting; in a slanting direction or position, neither horizontal nor vertical; unequal-sided
- Obliquely elongated** – the seed is like a narrowly drawn-out pyramid with the dorsal face curved and prolonged into a thin “tongue”; the terminal face is small, flat and oblique on the seed with the hilum in the middle; the sides are ridged
- Oblong** – elliptical and two to four times longer than wide, with approximate parallel sides
- Obovate** – egg shape in outline, with the narrow end on the base; inversely ovate; having the shape of the longitudinal section of an egg, with the broad end at the top
- Obovoid** – like ovoid (hen's egg shape) but narrow end at the base; inversely ovoid; roughly egg-shaped, with narrow end downwards
- Obpyramidal** – pyramid-shaped, with attachment at or near the narrow end, (*cf.* **pyramidal**)
- Obtrullate** – trowel-shaped, with attachment at or near the narrow end, (*cf.* **trullate**)
- Obtuse** – rounded or blunt; with the tip bluntly rounded; with blunt or rounded end
- Ocellate** – having eye-like depressions, each with a raised circular border
- Orbicular** – more or less circular; round or shield-shaped
- Oval** – broad, ellipse shape with rounded ends
- Ovate** – broad and rounded at the base and tapering at the end; egg shaped and attached by the broader end; having the shape of a longitudinal section of an egg
- Ovary** – the lower part of the pistil that contains the ovules; the enlarged hollow part of a pistil in angiosperms in which ovules are formed
- Ovoid** – egg-shaped in three dimensions; like a hen's egg, with one end narrower than the other, wide end at the base, (*cf.* **obovoid** and **ellipsoid**); the seed is ovoid or elliptical in outline but flattened with the hilum on the more or less concave ventral side; a large number of species have this type of seed which are otherwise difficult to describe
- Palea** – is the inner and usually smaller of two scaly bracts immediately subtending the grass flower in a spikelet; it is on the opposite side of the floret than another leaf-like structure that is referred to as the lemma; the upper, and usually shorter and thinner, of two membranous bracts enclosing the flower in grasses
- Papilla** – a glandular hair with one secreting cell above the epidermis level
- Papillate** – with minute, rounded, nipple-like projections
- Papillose** – descriptive of a surface beset with short, blunt, rounded, or cylindric projections
- Pappus** – a ring of fine hairs on some types of seeds which aid wind-dispersal; a tuft of hairs on a fruit; *in Asteraceae*, a tuft (or ring) of hairs or scales borne above the ovary and outside the corolla and possibly representing the calyx
- Penicillate** – having the form of a pencil
- Pepo** – a berry with hard, leathery rind, usually applied to fruits in the family *Cucurbitaceae*
- Perianth** – a collective term for both the calyx and corolla
- Pericarp** – the external layer of a fruit; the fruit wall which has developed from the ovary wall; sometimes used for any fruit covering
- Perennial** – a plant that grows for 3 or more years and usually flowers each year
- Persistent** – remaining for a long time

- Pilose** – covered with downy hair; hairy; pubescence comprised of scattered long, slender, soft hairs
- Pistil** – the female part of the flower
- Plano-convex** – flat on one side and convex on the other
- Plumose** – with hairlike branches, feathery
- Pod** – stems from a paracarp ovary; it includes only two carpels and is divided by a central septum; when ripening, two flaps fall off while the septum and the placentas (replum) stay
- Pointed at one end** – the seed is somewhat flattened, usually rounded at one end and pointed at the other; it may be described as **teardrop-shaped**
- Polachenarium** – monocarps separating from a longitudinal central axis (columell or carpophore), dehiscent or indehiscent, often remaining attached to axis maturity
- Polymorphic** – having, assuming, or occurring in various forms, characters, or styles
- Prickle** – a hard, pointed outgrowth from the surface of a plant, involving several layers of cells but not containing a vein
- Prismatic** – cubic shape; square shape
- Pro** – prefix meaning before
- Pseudo** – prefix meaning false
- Pseudocarp** – is a false fruit, because it does not contain the seeds; the seeds are achenes, on the outside of the fleshy fruit (strawberry)
- Puberulent (puberulous)** – covered with fine, short, and nearly imperceptible down; minutely pubescent, the hairs soft, straight, erect, but scarcely visible to the unaided eye; covered with minute, soft, erect hairs
- Pubescent** – a general term for hairiness; covered with soft hair or down; covered with short, soft, erect hairs
- Punctate** – covered with very small depressions; dotted – marked with dots; with depressed dots scattered over the surface; marked with dots looking like pencil marks variously scattered
- Puncticulate** – minutely punctate, the surface being almost smooth; minutely dotted
- Pusticulate** – with small broad slight elevations not so high or as abundant as on a colliculate surface and not having as abrupt elevations as a minutely tuberculate surface; covered with small pustule- or blister-like elevations
- Pustulate hair** – hair with an enlarged base
- Pyramidal** – the seed is pyramid shaped with a relatively smooth or lacunose, flat or rounded dorsal side; the ventral side is usually ribbed, wrinkled or angled and is surmounted by a narrowed face at the summit where the hilum is
- Pyrene** – is a seed covered by a stony layer; fruit containing pyrenes are called drupes; the ‘stone’ (endocarp plus seed) of a succulent fruit, (*cf.* **berry, drupe**)
- Pyriform** – pear-shaped
- Quadrante** – more or less square
- Rachilla** – the zigzag center upon which the florets are arranged in the spikelet of grasses or in some sedges; the main axis of the spikelet in grasses; the lateral or secondary branches of the inflorescence; of a grass spikelet, the axis above the glumes
- Radially** – arranged or having parts arranged like rays developing uniformly around a central axis
- Radicle** – is the first part of a seedling (a growing plant embryo) to emerge from the seed during germination; the radicle is the embryonic root of the plant, and grows downward in the soil
- Raphe** – a ridge around the seed formed by the funiculus
- Recurved** – curved with the outside of the curve expanded (like a sickle, or a new moon)
- Rectangular** – resembling a rectangle in outline
- Reniform** – having the form or shape of a kidney

- Reticulate** – net-like, with raised walls forming the “net”; like network; with a raised network of narrow and sharply angled lines frequently presenting a geometric appearance, each area or depression outlined by the reticulum being an interspace
- Reticulate-areolate** – with a raised network marked off by fine lines
- Reticulate-foveate** – intermediate between reticulate and foveate
- Retuse** – with a shallow, rounded notch at the apex
- Revolute** – said of margins that are rolled backward (toward the abaxial side)
- Rhombic** – diamond-shaped in outline; having the form of a rhombus
- Ribbed** – ribbedly ascending elevations on the smooth surface
- Ridged** – having raised lines or ridges; with parallel elongated projections, coarser than striate; opposite to “furrowed”
- Ring** – annulus
- Rhomboidal** – resembling a rhomboid in outline, diamond shaped
- Root** – the part of a plant that anchors it in the soil and absorbs nutriment and moisture necessary for growth
- Rotate** – shaped like a wheel; radially spreading in one plane
- Rough** – having a bumpy, uneven surface, not necessarily following any pattern or structure
- Round** – having a circular outline
- Rugose** – (wrinkled) covered with coarse, blunt projections of variable size; having or full of wrinkles; corrugated; ridged; wrinkled, the irregular elevation making up the wrinkles and running mostly in one direction
- Rugulose** – finely wrinkled; with very small wrinkles; same as rugose
- Ruminate** – penetrated by irregular channels giving an eroded appearance and running in different directions
- Samara** – is an independent dry indehiscent fruit which has part of the fruit wall extended to form a wing (i.e. not a winged seed inside another type of seed pod)
- Scabrous** – with a rough surface; with small points or knobs, like a file; scaly, scabby, rough
- Scalariform** – with small fairly regular cross-band markings suggest the step of a ladder; resembling the rungs of a ladder; ladderlike; resembling a ladder in form or appearance; having transverse bars or markings like the rounds of a ladder; as, the scalariform cells and scalariform pits in some plants
- Scalelike** – consisting of overlapping layers, like fish scales
- Scaly** – part or wholly covered with scales or thin plates
- Schizocarp** – from a compound pistil, splits into **mericarps** (pieces) which enclose one or more seeds and resemble fruits themselves; a dry fruit, as in the maple, that splits at maturity into two or more one seeded carpels which remain closed; a dry fruit formed from more than one carpel but breaking apart into 1-carpel units when ripe
- Scrobiculate** – with elongated shallow depressions or pits
- Scurfy** – covered with small, brainlike scales; indicates a roughened surface; scurfy surface has a top layer that is coming off in all sorts of flakes, threads and powder, and many of the particles are still partially attached to the surface while others are not; surface covered with tiny flakes or scales
- Seed** – normally is surrounded by a tough shell, the testa, that is derived from one or more integuments; it contains the endosperm, a nourishing tissue; the ripened ovule of a plant containing the embryo, the means by which a plant may propagate sexually
- Separable** – easily separated or dis-joined
- Septum** – a partition separating two cavities or masses of tissue, as in fruits, pl. septa
- Serrate** – with the edge broken or notched so as to resemble the toothed edge of a saw
- Sessile** – without a stem; attached directly to the stem

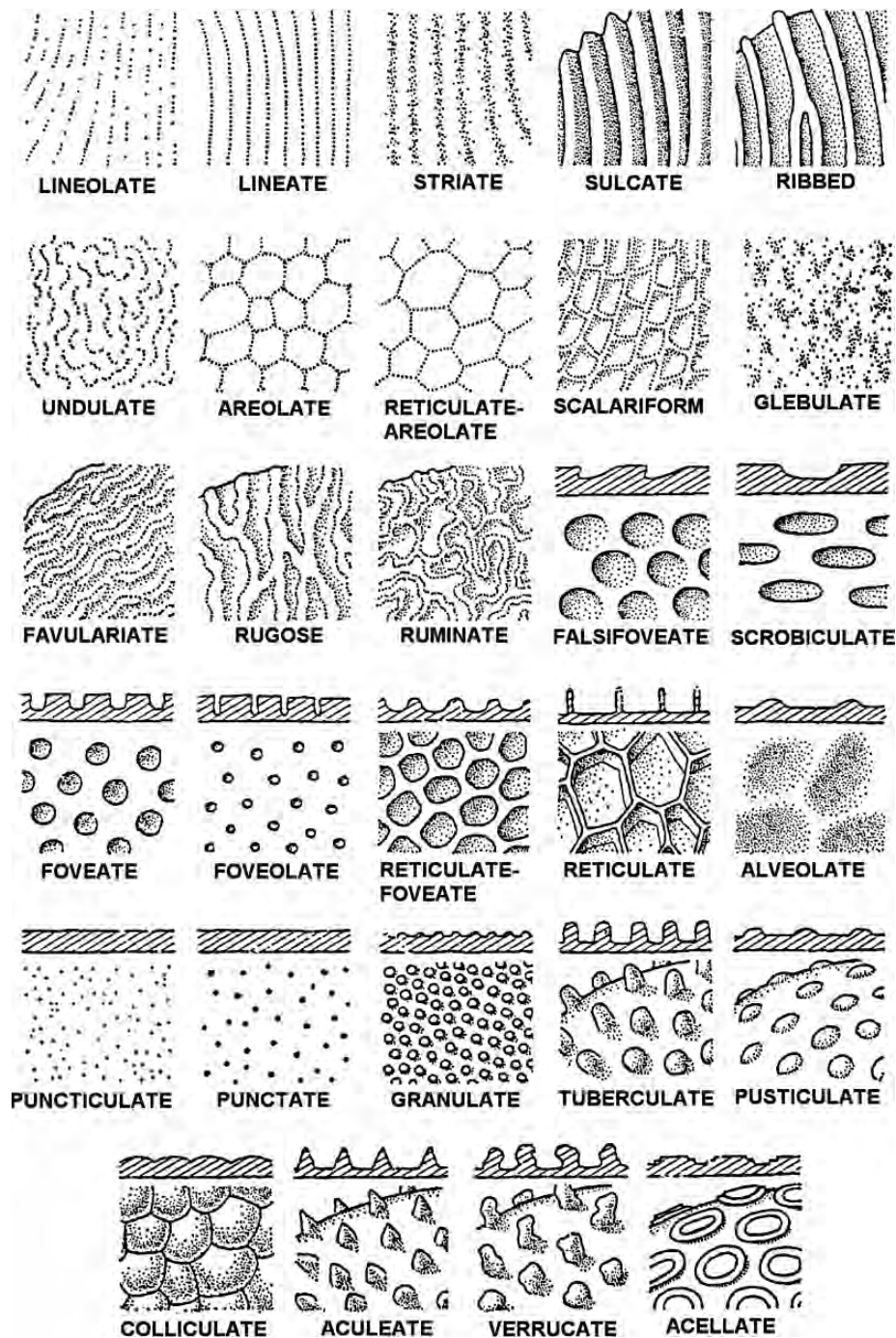


- Seta** – a bristle-like structure
- Setaceous** – bristly; set with bristles; consisting or having bristles
- Setae** – bristles
- Silique/Silicle** – special capsule with two halves which fall away from a central false septum (replum) to which the seeds are attached; **siligues** are long and thin; **silicles** are short and fat
- Silky** – covered with shiny, close-set fibrils
- Simple** – opposite to branched
- Sinuate** – with a U-shaped indentation next to the stem
- Smooth** – having an even consistency, without irregularities or projections
- Sinuate** – having a wavy margin
- Spatulate** – shaped like a spatula or spoon in outline, broad rounded apex and narrow base
- Spherical** – the seed is more or less spherical; having the shape of a sphere; globular
- Spicate** – having the form of a spike
- Spicule** – a small, slender, sharp-pointed piece, usually on a surface; a small spike of flowers
- Spike** – a long flower cluster attached directly to the stalk
- Spikelet** – a small spike of a large one; a subdivision of a spike; as the spikelets of grasses
- Spine** – a needle-like modification of the epidermis
- Spinose** – with sharp protruding projections
- Spiny** – covered with spines, thorns, or other stiff projections
- Stalk** – the stem or main axis of a plant, which supports the leaves, flowers, and fruit. Any lengthened support on which an organ grows, as the petiole of a leaf or the peduncle of a flower
- Stalked** – with stem
- Stellate** – star-shaped; starlike; said of hairs that branch in such a manner as to radiate from a central point
- Stigma** – the terminal part of the gynoecium, which receives the pollen; the upper tip or part of the pistil of a flower receiving the pollen, it is generally situated at the upper extremity of the style
- Striate** – marked with shallow stripes; with fine parallel projections; marked by narrow lines, grooves or ridges, usually parallel; marked with a series of line narrow parallel bands, wider than the lines of a lineate surface
- Strophiole** – syn. caruncle; a crestlike excrescence about the hilum of certain seeds; a caruncle
- Style** – the narrow tube that runs between the ovary and the stigma; slender upper part of pistil, supporting stigma
- Stylopodium** – the fleshy support at the base of the style in flowers of the carrot family, *Umbelliferae*
- Sub** – prefix meaning “somewhat”
- Subglobose** – nearly but not completely spherical
- Suborbicular** – approximately circular
- Subulate** – awl-shaped; slender and tapering gradually to a fine point
- Sulcate** – with one marked depression, often surrounding hilum; furrowed, grooved; scored with deep, parallel furrows or grooves; grooved or furrowed with long V-formed depressions
- Suture** – a seam formed when two parts unite; a seam or line or groove; usually applied to the line along which a fruit dehisces; any lengthwise groove that forms a junction between two parts
- Syncarp** – a multiple or aggregate fruit derived from numerous separate ovaries of a single flower; a collective unit, as a blackberry
- Tawny** – brownish-yellow; tan
- Terete** – approximately circular in cross section; width and thickness approximately equal
- Terminal** – at the apex or distal end
- Testa** – seed coat
- Thorn** – a modified plant organ, especially a stem, that is stiffened and terminates in a pungent point

- Throughout** – in all parts of the structure
- Tomentose** – covered with wooly hairs; densely covered with short, matted hair
- Transverse** – lying, situated, or placed across
- Trichome** – an epidermal outgrowth, *e.g.* a hair (branched or unbranched), a papilla
- Trichotomous** – branching almost equally into three parts
- Trigonal** – triangular in cross section
- Trigonous** – trigonal; having three prominent longitudinal angles, as a style or ovary; triangular in cross-section and obtusely-angled, (*cf.* **triquetrous**)
- Triquetrous** – triangular; having a triangular cross section; triangular in cross-section and acutely-angled; with three distinct longitudinal ridges, (*cf.* **trigonous**)
- Trullate** – trowel-shaped, generally with the attachment at or near the broad end, (*cf.* **obtrullate**)
- Truncate** – terminating abruptly, as if tapering end were cut off; cut squarely across, either at the base or apex of an organ; with an abruptly transverse end, as if cut off
- Tubercle** – a tapering swollen projection usually differing in appearance from the fruit/seed; a small wart-like outgrowth
- Tuberculate** – bearing small, warty, swelling, rounded or variously shaped projections; with small smooth rounded projections or knobs; covered with tubercles
- Turbinate** – top-shaped, obconical
- Umbilicate** – having a navel-like depression
- Undulate** – wavy-margined; more or less wrinkly surface; wavy, *i.e.* not flat, (*cf.* **sinuate**)
- Urceolate** – shaped like a pitcher or urn; urn-shaped
- Utricle** – an air bladder of aquatic plants; membranous indehiscent 1-celled fruit; a small bladder; a membranous bladder-like sac enclosing an ovary or fruit
- Vein** – a strand of vascular tissue
- Venation** – the arrangement of veins in a leaf
- Ventral** – of the side of an organ facing the axis, (*cf.* **dorsal**)
- Verticillate** – having parts in rings or whorls
- Vericulose** – with a delicate, bubbly or foamy texture
- Verrucate/Warty** – with irregular projections or knobs
- Verrucose** – densely covered with wart-like projections; similar to **rugose** but projections isodiametric; warty; having little warts or wartlike growth on the surface; covered with wart-like outgrowths, warted
- Verruculate (verruculose)** – covered with closely spaced tiny irregular projections; covered with closely spaced, minute wart-like outgrowths
- Verticil** – an arrangement of the structures which surround the stem in a circle upon the same plane about the same point on the axis
- Verticillate** – growing in a whorl or arranged on the same plane around an axis, as flowers, leaves, branches, etc.; arranged in verticils, whorled; arranged in one or more whorls
- Villous** – pubescent; shaggy; covered with fine long hairs, but the hairs not matted; shaggy with long, weak hairs, (*cf.* **hirsute**)
- Whorl** – a ring one turn of a spiral
- Wing** – a broad, thin projection

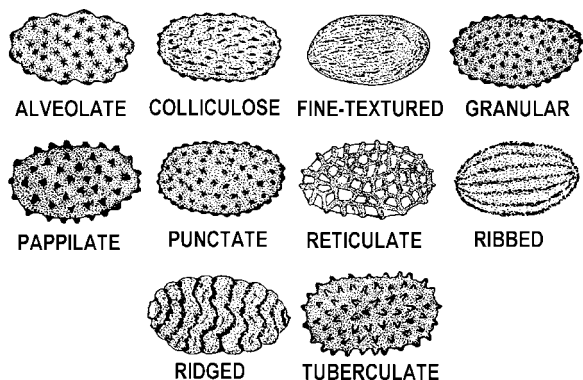
## VII PICTORIAL GLOSSARY

### *TYPES OF SURFACES OF SEEDS*

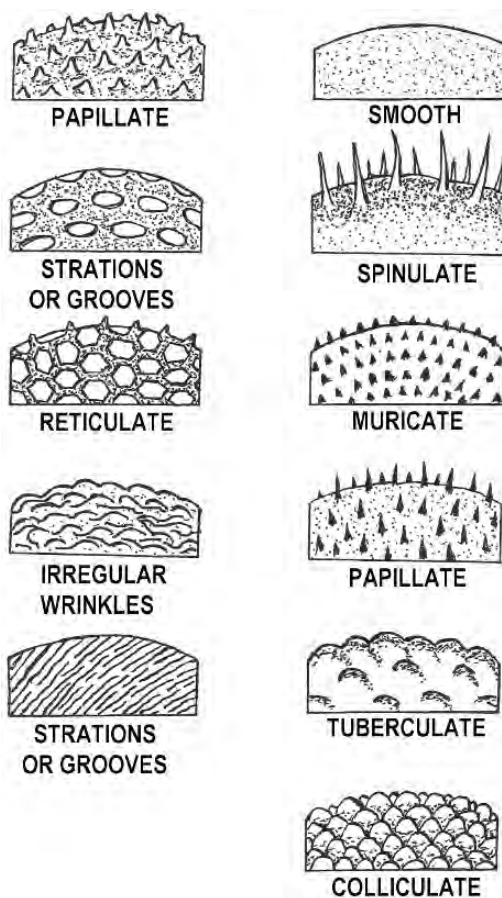


Drawing by Margaret R. Murley, *American Midland Naturalist*, 46, 1951

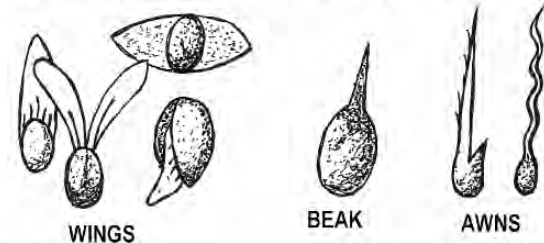
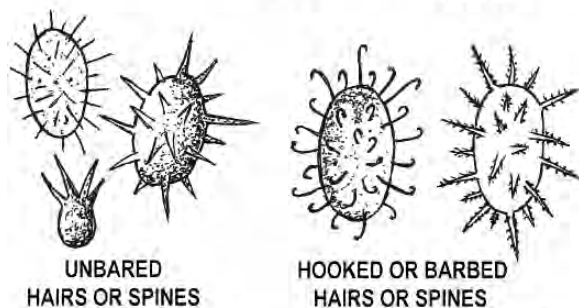
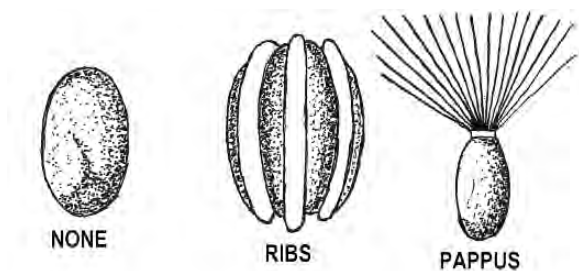
## SEEDS AND FRUITS SURFACE



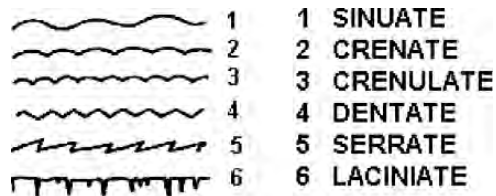
## SURFACE FEATURES OF DISSEMINULE



## SOME LARGE SCALE FEATURE OF DISSEMINULE



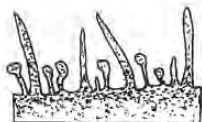
## MARGINS (EDGES)



## INDUMENTUM TYPE



SIMPLE HAIR



SIMPLE AND GLANDULAR HAIR



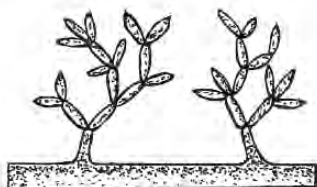
CAPITATE HAIRS



CLAVATE HAIRS



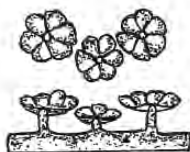
VESICULAR HAIRS



DENDRITIC (BRANCHED) HAIRS



STELLATE (STAR-SHAPED) HAIRS



PELTATE SCALES

## APICES



MUCRONATE



PAPILLATE



ACUTE



BEAKED

## INCISION OF SEED & FRUITS

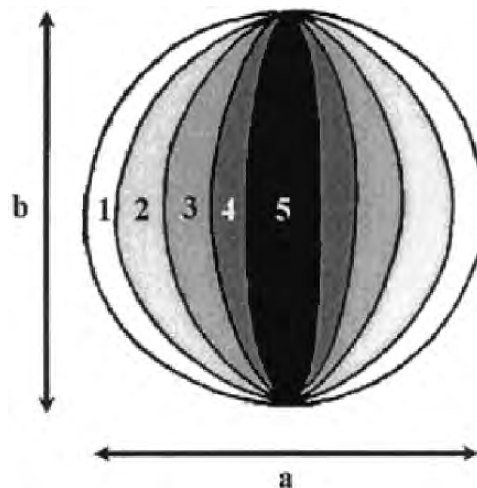


CILIATE

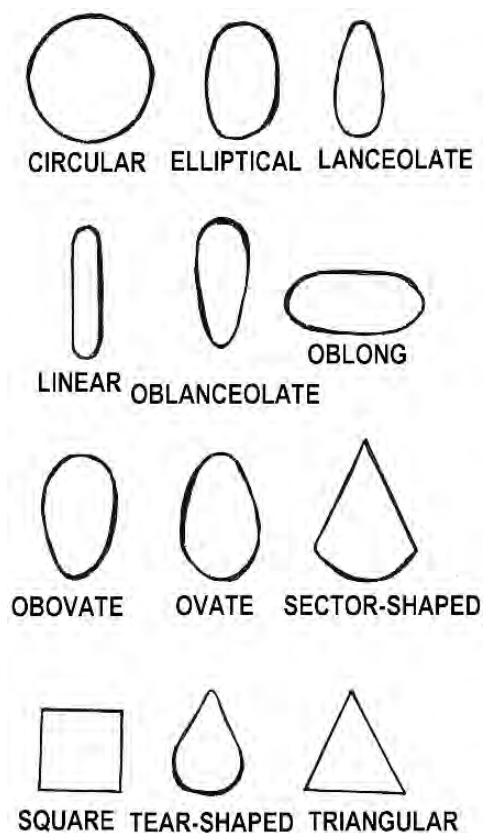
## PICTORIAL KEY TO SHAPES

Shapes based on the sphere and ellipsoids,  
distinguished by the ratio of  $a : b$

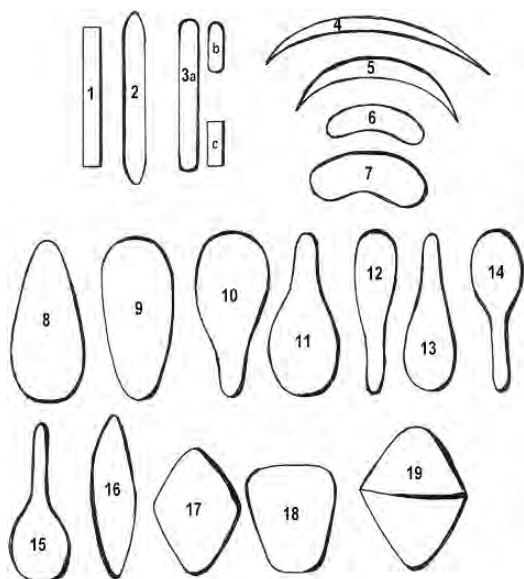
- 1 : 1 globose or spherical
- 1 : 2 subglobose or prolate spheroidal
- 1 : 3 broadly ellipsoidal (sub-prolate) to ellipsoidal (prolate)
- 1 : 4 oval (per-prolate)
- 1 : 5 fusiform



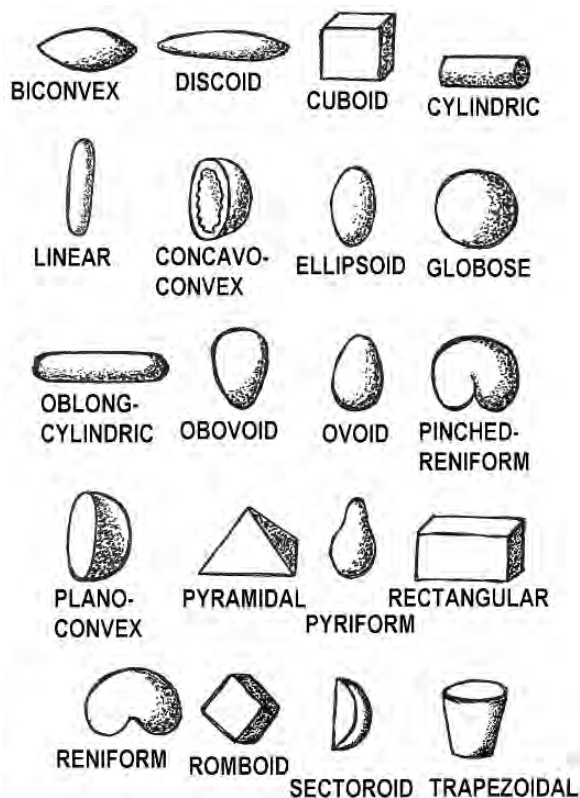
*Two-Dimensional Seeds & Fruits Shapes*



*Three-dimensional structures*



*Three-Dimensional Seeds & Fruits Shapes*

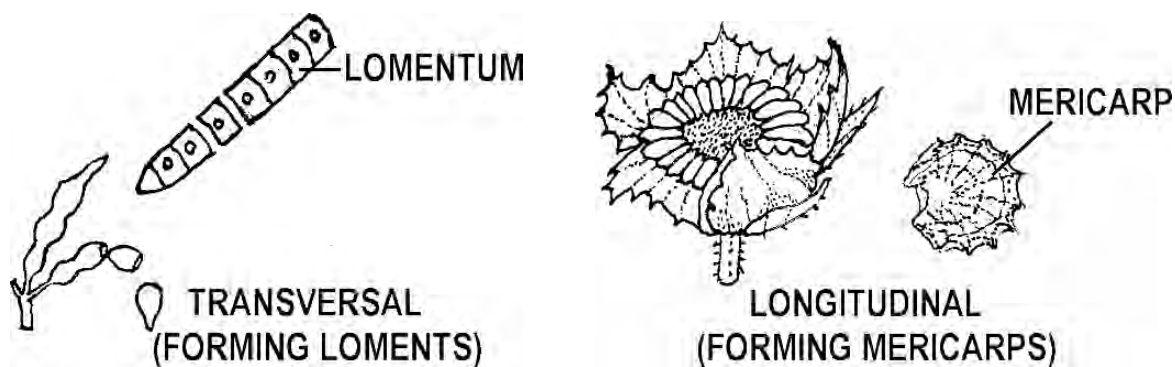


- 1 filiform
- 2 acrose
- 3 cylindrical, restricted to shape where length to width 2:1 to 3:1
  - 3a bacilliform
  - 3b with rounded apices
  - 3c with truncated apices
- 4 falcate
- 5 lunate
- 6 allantoid
- 7 reniform
- 8 ovoid
- 9 obovoid
- 10 pyriform
- 11 obpyriform
- 12 clavate
- 13 obclavate
- 14 spatulate
- 15 lageniform
- 16 cymbiform (navicular)
- 17 quadrangular (rhomboidal)
- 18 cuneiform
- 19 biconic

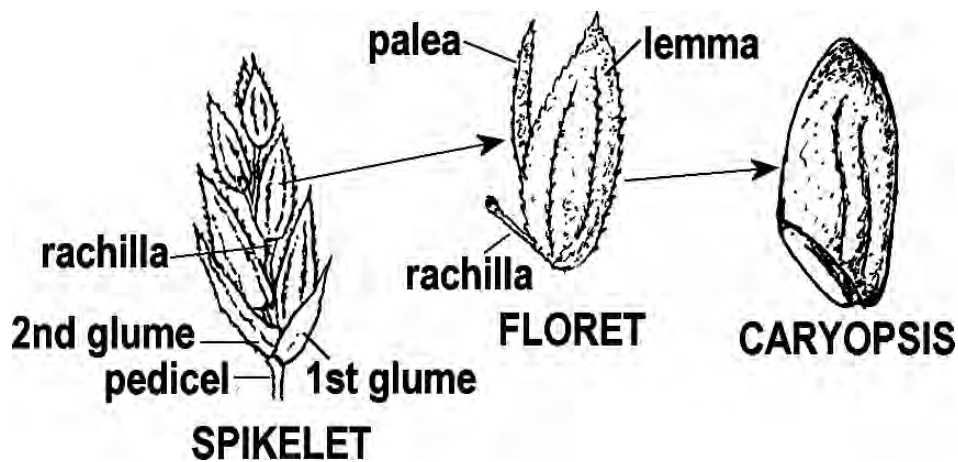
SEEDS AND FRUITS ANATOMY



SCHIZOCARP



POACEAE FLOWERS, FRUITS AND SEEDS PARTS



## VIII TAXONOMY AND MORPHOLOGY OF SEEDS

### A. GYMNOSPERMAE

#### 1. CYCADACEAE

1. *Cycas revoluta* Thunb. — Shrub, low, handsome, dwarf plant, bearing a corona of long, compact, dark-green, fan-shaped leaves. **Seeds ovate orbicular, apex truncate with a small point, slight flattish, base with a large whitish hilum, 30-45 x 25-35 mm. Surface wrinkly on both lateral sides with a smooth rounded area, c. 1 cm in diam., orange or henna color.** Originally growing in Japan, China, Java; cultivated in warmer areas in the open and in greenhouses. Leaves are used in gardening as a garland material.

#### 2. GINKGOACEAE

2. *Ginkgo biloba* L. — Dioecious tree, 30-40 m high with a conical corona. A remaining species from the Arctotertiary period. **Seeds cylindrical or ovate, biconvex with 2 or 3 lateral seams, apex pointed gradually, 15-20 x 12-15 mm. Surface glabrous, dull or slight lustrous, whitish-yellow. 2n = 24.** Native to China, Japan; cultivated in parks as a historical interesting and ornamental tree. Hu, Mo, Ro, Sk, Uk.

#### 3. TAXACEAE

3. *Taxus baccata* L. — Middle, dioecious coniferous shrub or tree, up to 20 m high. **Seeds broad elliptic with one or no seam, apex pointed, 6-8 x 4-5 mm. Surface structured finely dark-brown, hilum light-brown. 2n = 24.** A tertiary circumpolar relict of the Northern hemisphere. Now grown on chalky downs in coniferous and mixed forests as undergrowth up to the elevation of 1400 m. Used as ornamental in parks and gardens; in the whole Carpathians.

#### 4. PINACEAE

4. *Abies alba* Mill., *A. pectinata* DC., *Pinus picea* L. — Tree, robust, up to 60 m high coniferous, with a conical corona cones upright, cylindrical. **Seeds irregular, triangular, slight flattish, base narrowed, 10-12 x 5.5-6.5 mm, wings widespread in the upper part, 15-20 x 10-15 mm. Surface wrinkly, dull, brown, wings brown-violescent. 2n = 24.** Native to Europe, forming forest of the montane zone; planted for timber in forests and as ornamental in parks. Br, Cz, Hu, Mo, Pl, Ro, Sk, Uk.

5. *Abies balsamea* (L.) Mill., *Pinus balsamea* L. — Tree, up to 25 m high, with tapering corona and smooth, red-brown scale bark. **Seeds triangular, slight, flattish, apex truncate, base narrowed, 5-6 x 3.7-4.2 mm, wings membranous, 8-10 mm long. Surface glossy, dark-brown. 2n = 24.** Place of origin in North America, on moist soils near lakes and streams; in the Carpathians rarely cultivated as an ornamental tree in parks and gardens. Br, Cz, Mo, Sk, Uk.

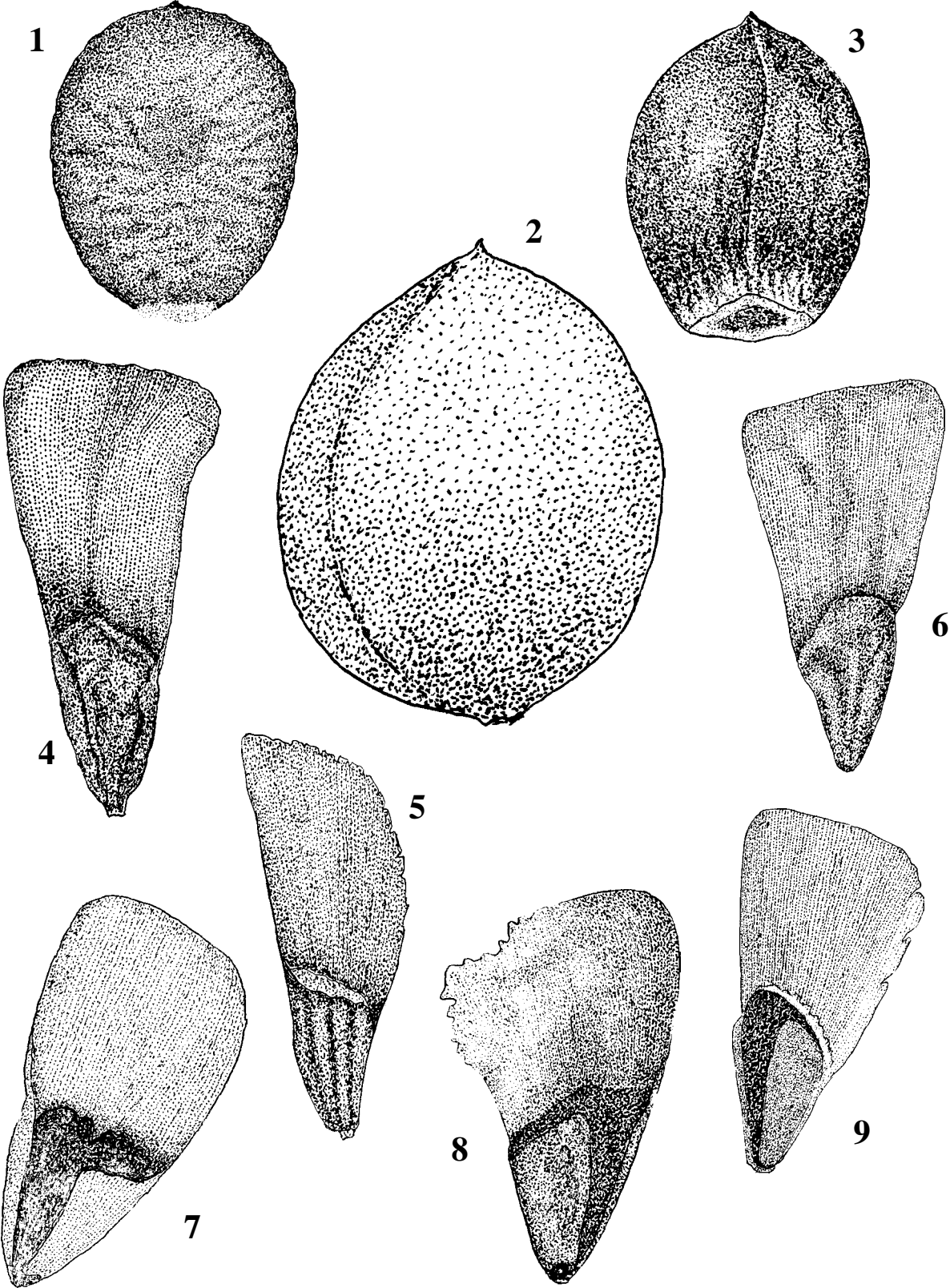
6. *Abies cephalonica* Loud. — Tree, with regular, conical corona, whorls of horizontal branches, up to 30 m high. **Seeds cuneate slight flattish, apex truncate or rounded, 10-13 x 5-6 mm, wings 15-20 x 10-13 mm. Surface weak lustrous, brown, wings pale-brown.** Place of origin in mountains of Greece; in the Carpathians very seldom, planted in parks and gardens as ornamental. Hu, Sk, Uk.

7. *Abies cilicica* Carr. — Tree, up to 20-30 m high, young twigs reddish-brown, needles c. 30 x 1.5 mm, with a flat margin, mostly in 2 rows, cones 15-25 x 4-5 cm in diam. **Seeds obtriangular, lateral flattish, c. 7.5 x 3.8 mm, wings 13-16 x 7-9 mm.** Native to the southern part of the Asia Minor; in the Carpathians rarely cultivated in parks and gardens in the southern Ukraine. Uk.

8. *Abies concolor* Lindl. et Gord. — Tree, up to 40 m high with dome-shaped corona cones upright, cylindrical. **Seeds round triangular, cuneate, flattish, apex truncate, 8-10 x 5-7 mm, wings 8-10 x 5-7 mm. Surface slight lustrous wrinkly, pale-brown, wings light-brown. 2n = 24.** Originally introduced from western North American mountains, tolerant of pollution, suitable for parks in towns; in the Carpathians often planted in parks. Br, Hu, Mo, Sk, Uk.

9. *Abies grandis* (Dougl. ex D. Don) Lindl., *A. gordoniana* Carr. — Tree, up to 50 m high, with a fast-growing, slender, conical corona, young twigs sparsely downy. **Seeds triangular cuneate, slight flattish, apex semiround or truncate, 8-10 x 5-6 mm, membranous wings 8-10 mm long. Surface smooth, slight lustrous, pale-brown.** Native to moist soils of North America; in the Carpathians seldomly cultivated for its timber in forests and as ornamental in parks.





**10. *Abies nobilis*** Lindl. — Tree, up to 70 m high with a dense dome-like corona. **Seeds prolonged triangular, slight bended, flattish, aslant truncate, 9-12 x 4-6 mm, wings membranous, 12-15 mm. Surface smooth, dull, with 2 or 3 spots on the dorsal side, dark-brown, wings pale-brown.** Place of origin North America, prefers deep moist soils; in the Carpathians rarely planted in park.

**11. *Abies nordmanniana*** (Stev.) Spach, *Pinus nordmanniana* Stev. — Tree, up to 20-40 m high, conical and richly branched corona. **Seeds irregular triangular, tapering to the hilum, 7.5-8.5 x 3.8-4.2 mm, wings about 8-10 mm long. Surface smooth, lustrous, dark-brown, wings dark-brown. 2n = 24.** Place of origin the Caucasus and Anatolia; a very decorative species, cultivated solitary or in small groups in parks. Br, Hu, Mo, Sk, Uk.

**12. *Abies pinsapo*** Boiss. — Tree, up to 20-30 m high, trunk stout, corona pyramidal, young twinges glabrous. **Seeds blunt, triangular, cuneate, slight compressed, apex truncate, 9-12 x 5.5-6.5 mm, wings 15-20 mm long. Surface glabrous, dull, brown, bottom part of wings lustrous, yellowish-brown, upper part reddish-brown.** Native to south-western Spain, on line-stone mountains; in the Carpathians seldom planted in parks, rarely for timber in warmer areas.

**13. *Abies sibirica*** Ledeb., *Pinus picea* Pal., *P. pichta* Fisch. — Tree, up to 30 m high, corona pyramidal, branches strongly ramified. **Seeds trigonous to obovoid, cuneate, apex truncate, 8-10 x 4-6 mm, membranous wings, 8-12 x 8-10 mm. Surface fine linear foveolate, dull, dark-brown, wings brown.** Native to east-northern Europe, as very important forest tree; in the Carpathians very seldom grown as an ornamental tree in warmer areas in parks. Br, Uk.

**14. *Abies veitchii*** Lindl., *A. eichleri* Lauche — Tree, up to 25 m high, grows slowly. **Seeds trigonous-cuneate obovoid, apex semiround, 5-6 x 2.5-3.5 mm, membranous wings 2-3.5 x 4.5-5.5 mm. Surface dull, pale-brown, wings pale-brown or violetish.** Native to Japan, resistant against frost; in the Carpathians rarely cultivated as an interesting decorative tree in parks. Br.

**15. *Pseudotsuga menziesii*** (Mirb.) Franco, *P. douglasii* Carr., *P. taxifolia* Britton — Tree, up to 40-50 m high, with a conical ridged corona and reddish-brown bark. **Seeds ovate triangular,**

**compressed, 5-7 x 3-4 mm, membranous wings about 10-12 mm long. Surface smooth, glossy, reddish-brown, wings light-brown. 2n = 24.** Place of origin western North America; extensively planted for timber in forests, also in park of the Carpathians, highly prized as an ornamental tree.

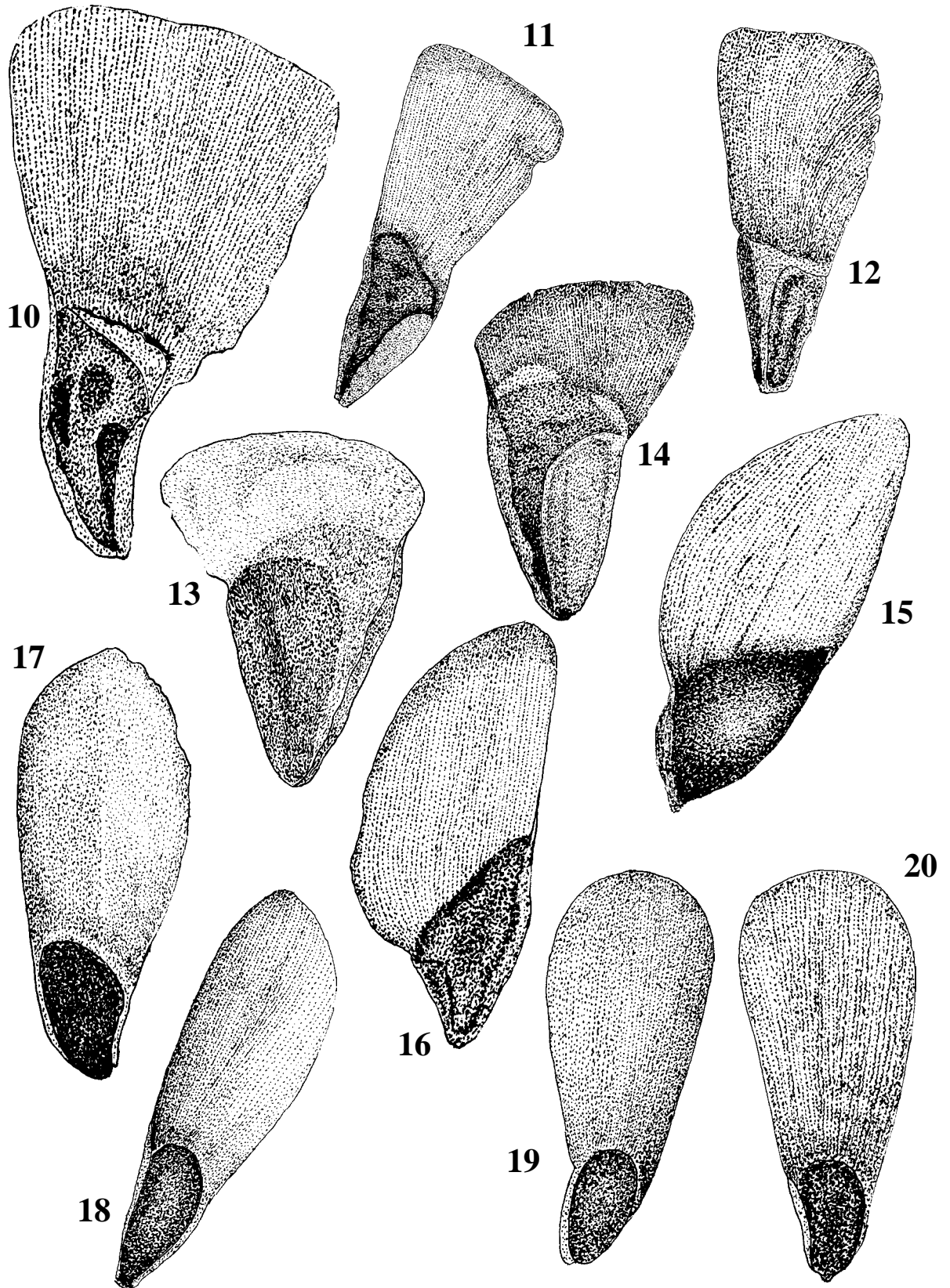
**16. *Tsuga canadensis*** (L.) Carrière, *T. americana* (Mill.) Farw. — Shrub or tree, about 20-30 m light, with a conical corona, cones ovoid, terminal. **Seeds irregular triangular, flattish, 2.5-4 x 2.5-3 mm, membranous wings 6-8 mm long. Surface of the dorsal side lustrous, ventral dull, dark-brown, wings light-brown.** Native to eastern North America, frost-resistant; often cultivated in parks, occasionally in forests. Br, Cz, Hu, Mo, Sk, Uk.

**17. *Picea abies*** (L.) Karst., *P. excelsa* (Lam.) Link., *Abies excelsa* (Lam.) DC., *Pinus abies* L. — Tree, robust, about 30-50 m high, with a pyramidal corona and reddish-grey bark. **Seeds trigonous-obovoid, 4-5 x 2-3 mm, membranous wings 8-12 mm long. Surface dark-brown to violaceous, wings whitish-brown. 2n = 24.** Place of origin Europe and Asia, the most important woody plant in furniture and building industries, paper-mills, used also as fuel; commonly cultivated in woods, parks and gardens in many cvs. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**18. *Picea engelmannii*** Parry ex Engelm. — Tree, up to 30-50 m high, with a conical, thick branched corona. **Seeds prolonged obovate, flattish, apex rounded, 2-3 x 1.5-2 mm, membranous wings 8-11 x 2.5-3 mm. Surface fine foveolate, dull, dark-brown, wings light-brown.** Native to western North America, frost and pollution-resistant, planted for timber mainly in north Europe; in the south seldom planted in parks. Br, Mo, Uk.

**19. *Picea glauca*** (Moench) Voss — Tree, up to 30 m high, twigs glabrous, greyish or pale-brown cones cylindrical, pendent. **Seeds obovoid or ellipsoid, lateral slight compressed, 2.6-3.1 x 1.4-1.7 mm, with a membranous wings 9-10.5 x 3.5-4 mm. Surface smooth, dull, blackish-brown.** Place of origin North America; in the Carpathians rarely planted for timber in woods and in parks in cooler areas.

**20. *Picea mariana*** (Mill.) Britton, *P. nigra* Link. — Tree, up to 15-25 m high, with a slender conical corona and a black bark. **Seeds elliptic-obovoid to cuneate, 1.5-2.3 x 0.8-1.2 mm, wings membranous, 7-8 mm**



**long. Surface dull, faint foveolate, dark-brown, wings light-brown.** Native to North America, experimentally planted for timber and paper-mills in Europe; very seldom in parks. Br.

**21. *Picea obovata*** Ledeb. — Tree, up to 30 m high, corona narrowly pyramidal. **Seeds obovoid to elliptic, apex rounded aslant, base narrowed, 3.5-4 x 1.8-2.1 mm, with membranous wings. Surface fine tuberculate, dull or faint lustrous, nigrescent-brown.** Native to Siberia, the Ural lowland and mountain woodlands; rarely planted in parks. Br.

**22. *Picea omorica*** (Pančić) Purk., *Pinus omorica* Pančić — Tree, up to 30 m high, slender coniferous with a conical corona and arcuate branches. **Seeds obovoid-cuneate to ellipsoid, 3-3.6 x 1.8-2.2 mm. Surface smooth or faint foveolate, dark-brown with small black commas.** Originally growing in the Balkan on carbonate slopes, quite resistant-pollution; cultivated for decoration in parks and forests. Br, Sk, Uk.

**23. *Picea orientalis*** (L.) Link — Tree, up to 40 m high, corona narrow up to widely conical, densely branched, with a smooth bark. **Seeds elliptic-obovoid, 2.5-3.5 x 1.8-2.2 mm, membranous wings about 7-9 mm long. Surface smooth, dull, dark-brown up to nigrescent, wings yellowish-brown.** Original extension in the western Caucasus and the Asia Minor, warm-climate woody-tree needing abundant rain falls, in the eastern Carpathians important decorative tree of parks and gardens, rarely planted for timber. Br, Mo, Uk.

**24. *Picea pungens*** Engelm. — Tree, up to 30-50 m high, with a markedly conical corona, twigs glabrous, becoming yellowish-brown. **Seeds obovoid, slight lateral compressed, 3.8-4.2 x 2.2-2.4 mm, wings 9-10 x 3.5-4 mm. Surface fine ascending reticulate, dull, brown, wings faint lustrous, pale-brown.** Native to North America; in the Carpathians often planted as ornamental in parks, in woods for timber in many cvs, drought- and pollution-resistant.

**25. *Picea sitchensis*** (Bong.) Carr., *P. falcata* (Raf.) Valck.-Sur. — Tree, robust, up to 35 m high, with a broad tapering corona and red-brown bark. **Seeds ellipsoid-cuneate, apex aslant truncate, 3.3-3.8 x 1.5-2 mm, membranous wings 7-9 mm long. Surface smooth, dull, dark-brown to nigrescent, wings light-brown. 2n = 24.** Native to west North America, one of the most valuable coniferous,

cultivated for timber and paper-mills production; in the Carpathians seldom planted in parks, gardens and forest.

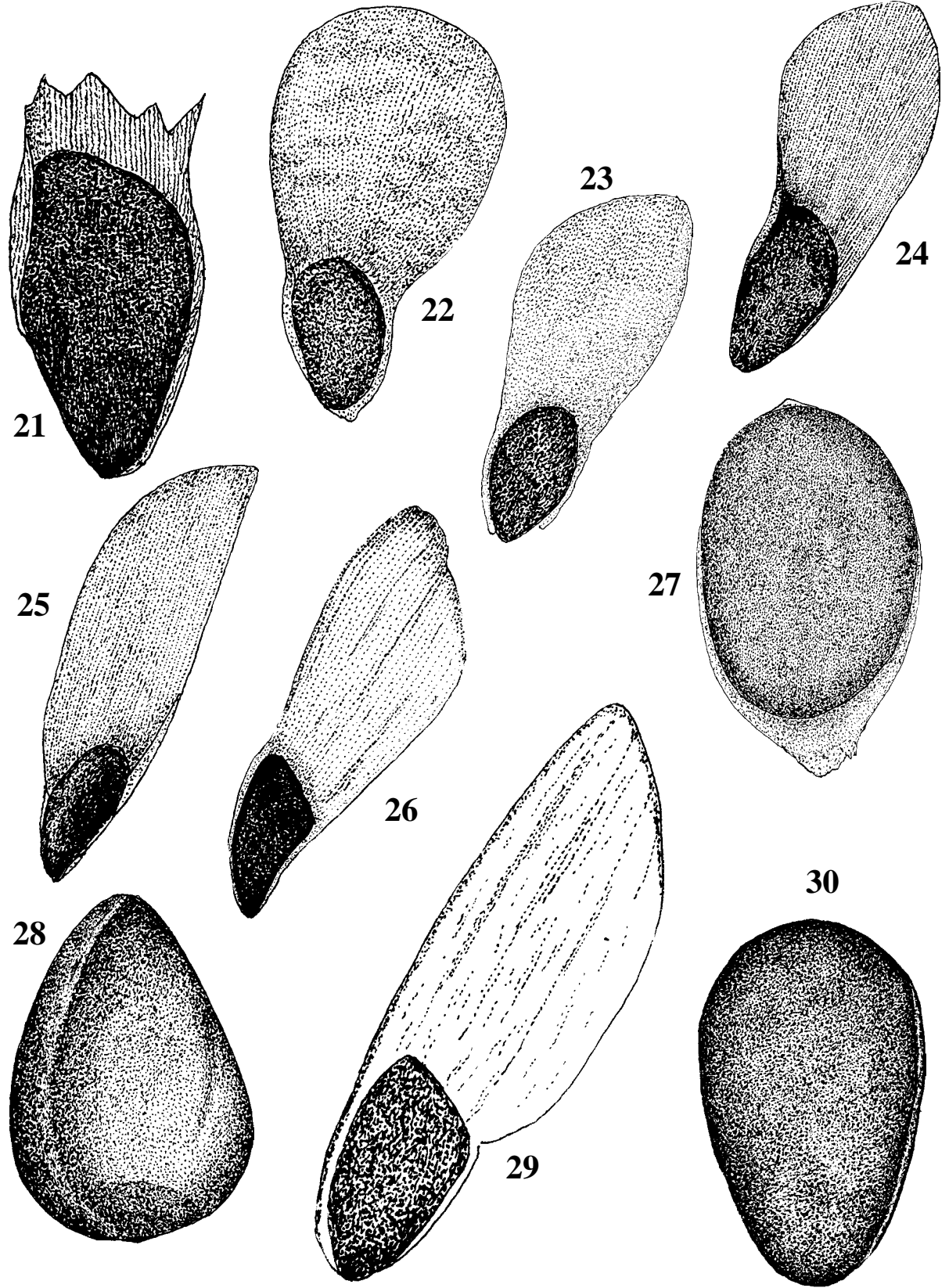
**26. *Pinus banksiana*** Lam., *P. divaricata* (Aiton) Dum. - Cours. — Small tree, up to 10-25 m high, the corona is ovoid up to irregularly diluted. **Seeds mostly triangular or obovoid, apex truncate or round, base narrowed, 3-5 x 1.5-2.5 mm, wings 7-9 x 3.5-4.5 mm. Surface faint tuberculate, dull, dark-brown up to nigrescent, wings red brown. 2n = 24.** Originally growing in North America, often on barren grounds as forest plantation; grown seldom in parks and gardens for peculiar shape of the corona. Br, Hu, Pl, Ro, Sk, Uk.

**27. *Pinus bungeana*** Zucc. ex Endl. — Tree, in the native country up to 20-30 m high, corona wide globose. **Seeds ellipsoidal with a small wing at the apex, easily falling down, slight flattish, 8-10 x 5-6.5 mm, membranous wings 2-5 mm long. Surface smooth, dull, brown to nigrescent, wings whitish-brown.** Place of origin the mountains of northern China, drought- and frost-resistant; in the Carpathians rarely cultivated in parks.

**28. *Pinus cembra*** L. — Tree, up to 25 m high with conical corona, silver-grey bark. **Seeds ovate, blunt angular, apex narrowed, base truncate, 8-12 x 6-8 mm, without wings. Surface smooth, dull, red-brown or nigrescent. 2n = 24.** Native to the subalpine positions of the Alps and the Carpathians, 1100- 2500 m; in the Carpathians rarely cultivated in parks as ornamental. Br, Pl, Ro, Sk, Uk.

**29. *Pinus contorta*** Dougl. ex Loud., *P. tenuis* Lemmon — Tree, up to 10 m high, corona dense, slender. **Seeds ellipsoid, apex truncate, base aslant-truncate, 4-5 x 2.5-3.2 mm, membranous wings 8-10 mm long. Surface faint foveolate, nigrescent to black, dull, wings whitish-brown. 2n = 24.** Originally growing in western North America, on sandy grounds, bogs, at high elevations; in the Carpathians rarely grown in parks and arboretums.

**30. *Pinus flexilis*** James, *P. reflexa* Engelman — Tree, up to 15 m high, corona broad, globose, decompose, cones are columnar. **Seeds obovoid to ellipsoid, slight flattish, with an indistinct marginal edge, 10-12 x 7.5-8.5 mm, without wings. Surface smooth, dull, greyish-brown with nigrescent spots.** Originally growing in western North America, 1500-3600 m elevations; introduced in to



the Carpathians and rarely planted in rock-gardens, arboretums, botanical gardens.

**31. *Pinus halepensis* Mill.** — Tree, up to 20 m high, corona rounded, trunk and branches often crooked, bark silvery-grey, becoming reddish-brown and deeply fissured. **Seeds obovoid, lateral slight flattish, 5.5-6.5 x 3-3.5 mm, membranous wings 18-23 x 4-6 mm. Surface smooth, dull, pale- up to dark brown, with black spots, wings salmon-pink.** Native to the Mediterranean region; in the Carpathians rarely planted as ornamental in parks and arboretums, in the warmest areas. Uk.

**32. *Pinus jeffreyi* Grev. et Balf., *P. deflexa* Torrey** — Tree, up to 20-40 m high with an upright trunk, oval conical up to globose corona. **Seeds obovoid to ellipsoid, slight flattish, with an indistinct marginal brim, 10-12 x 6-7 mm, wings 2-3 mm. Surface smooth, dull, marble-brown to nigrescent, wings easylike deciduous. 2n = 24.** Originally growing in California, Oregon, up to 1700 m elevation; in the Carpathians rarely planted in parks, gardens, arboretums, as a decorative tree.

**33. *Pinus montezumae* Lam., *P. russeliana* Lindl.** — Tree, up to 20-30 m high, bark reddish-brown, cones hanging down, 30-40 mm long, yellowish-brown. **Seeds  $\pm$  trigonous-ovoid, 5-5.4 x 3.8-4.2 mm, membranous wings 15-20 mm. Surface of the grains smooth, lustreless, dark-brown, wings pale-brown.** Native in the Asia Minor; in the Carpathians rarely cultivated in parks and gardens as a very decorative. Uk.

**34. *Pinus mugo* Turra, *P. mugus* Scop., *P. montana* Mill.** — Shrub, up to 2-2.5 m high, stems creeping, twisted or a small tree. **Seeds obovate, apex rounded, base narrowed, 4-4.5 x 2.5-3 mm, wings 2x longer than seeds. Surface smooth, dull, pale-brown, sometimes spotted, nigrescent. 2n = 24.** Native to mountains of Europe up to 2500 m elevation, the stands have soil- and water- protecting function; planted in parks and rock-gardens. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**35. *Pinus nigra* L., *P. laricio* Poir., *P. austriaca* Höss** — Tree, up to 35-50 m high, trunk erect, rhitidome blackish-grey, corona mighty. **Seeds ellipsoid, apex rounded, base narrowed, 6.8-7.5 x 3.8-4.3 mm, wings membranous, 12-18 mm long. Surface dull, smooth, pale-brown with dark-brown or nigrescent spots, wings shiny light-brown,**

**striped darkerly. 2n = 24.** Native to southeastern Europe; often cultivated on calcareous grounds, in forests and parks, too. Br, Cz, Hu, Pl, Ro, Sk, Uk.

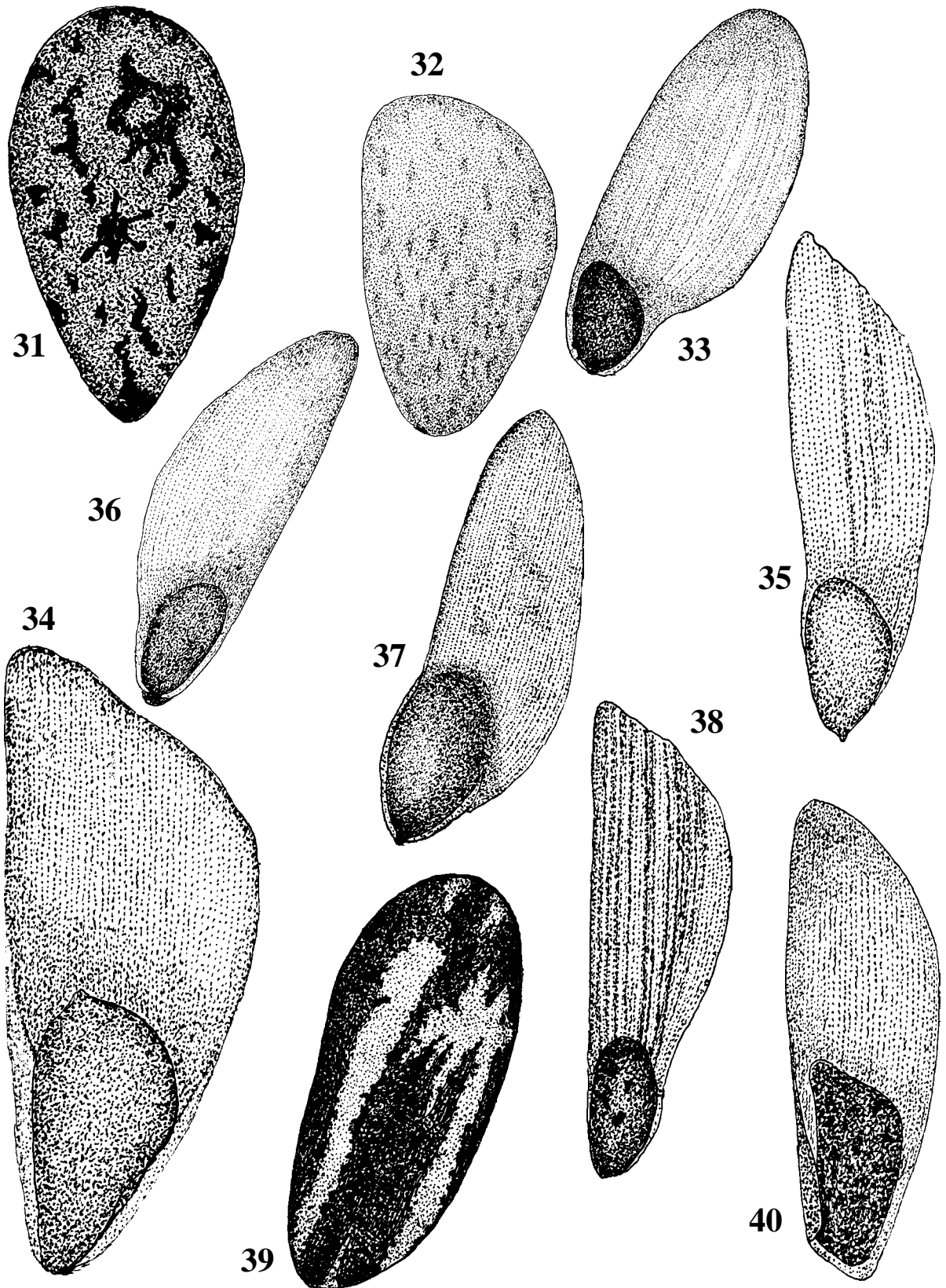
**36. *Pinus pallasiana* Lam.** — Tree, up to 25 m high, with a broadly pyramidal corona. **Seeds ellipsoid, apex and bottom rounded, 7-9 x 4.2-4.6 mm. Surface smooth, dull, pale-brown, lustrous.** Native to the Balkan Peninsula and the southeastern Carpathians; planted for its timber. Br, Ro, Uk.

**37. *Pinus peuce* Griseb.** — Tree, up to 20-30 m high growing straight, corona regular, conical, bark grey-brown. **Seeds ellipsoid, apex rounded, base slight wrinkly, 7.5-8.5 x 5-6 mm, wings membranous, 12-14 x 8-9 mm. Surface sometimes with black spots, wings reddish-brown.** Native to Balkan Peninsula, 750-2200 m, in pure or mixed forests; cultivated for durable, valuable wood; in the Carpathians planted very seldom in parks and gardens. Br.

**38. *Pinus pinaster* Aiton** — Tree, up to 40 m high, bark deeply fissured, reddish-brown, buds oblong, fusiform, not resinous, cones are oval. **Seeds ellipsoid, slight lateral compressed, margin narrow winged, 7.6-8 x 4.2-4.6 mm, wings 26-32 x 8-10 mm. Surface smooth, lustreless, grey, with black spots, wings salmon-pink, with darker stripes. 2n = 24.** Native to southwestern Europe; in the Carpathians sometimes planted for timber, also as a sand-binding or a shelter.

**39. *Pinus pinea* L.** — Tree, up to 30 m, parasol-shaped, bark greyish-brown, twigs glabrous. **Seeds prolonged ellipsoid, apex and base rounded, smooth, 15-20 x 7-11 mm, unwinged or with a very short (c. 1 mm) caducous wings. Surface dull, terracotta, less or more spotted black.** Native to the Mediterranean region, dominant tree on sandy grounds near sea level; cultivated or subsontaneous in warmer climate. Uk.

**40. *Pinus ponderosa* Dougl.** — Tree, up to 70 m high, robust, corona dense, slimly conical. **Seeds elliptic, apex aslant truncate or rounded, base mostly rounded, 7-9 x 5-6 mm, membranous wings 18-25 x 5-7 mm. Surface faint foveolate, dull, nigrescent, spotted black.** Native to mountains of North America, beautiful, fast-growing, frost-resistant, suitable for cultivation in cooler areas; seldom planted in forests, parks, arboretums. Br, Mo, Pl, Ro.



**41. *Pinus radiata*** D. Don – Tree, up to 40 m high, bark thick, fissured, dark-brown, buds ovoid-cylindrical, resinous, twigs glabrous. **Seeds obovoid or ellipsoid, lateral slight compressed, 6-8 x 3.5-4.5 mm, wings 20-26 x 7-9 mm. Surface more or less tuberculate, dull, greyish-brown to blackish, wings salmon-pink.** Native to south California; in Carpathians rarely planted in forests for timber, as a shelter, and also in parks.

**42. *Pinus rigida*** Mill. – Tree, up to 20 m high, corona broadly ovoid, airy, trunks often crooked, cones are pendent, oval. **Seeds triangular, apex aslant truncate, base narrowed, 3.8-4.6 x 2.4-3 mm, wings 15-20 x 5-6 mm. Surface dull, faint foveolate, nigrescent, spotted black. 2n = 24.** Originally growing along the Atlantic Ocean coast in North America, unpretending, adaptable, a light-loving species; occasionally planted as a decorative in parks. Br, Hu, Pl.

**43. *Pinus sabiniana*** Dougl. – Shrub, up to 20 m high, corona globose or angular, aerial, bark black to reddish-brown. **Seeds ellipsoid, apex rounded, base slight narrowed, 17-27 x 9-12 mm, wings 5-10 mm long, with a serrate margin.** Native to western North America, common on the foothill slopes; in the Carpathians planted very rarely in parks, arboretum and botanical gardens. Uk.

**44. *Pinus sibirica*** Du Tour – Tree, up to 40 m high, bark reddish-grey, bud-scales shining brown. **Seeds of irregular shape, mostly obovoid, ellipsoid or triangular, with narrow, fragile wings, mostly without wings, 5-6 x 2-3 mm, dimensions with wings, 10-15 x 7.5-8.5 mm. Surface fine undulate, lustreless, reddish- to dark-brown.** Native to Siberia and northeastern Europe in mountains and cooler regions; occasionally planted for timber. Br.

**45. *Pinus strobus*** L., *P. nivea* Booth, *Strobus strobus* Small – Tree, up to 40-50 m high, corona regular, narrowish conical, wide later on. **Seeds obovoid to ellipsoid, apex mostly aslant truncate, base narrowed, 6.5-7.5 x 3.2-3.8 mm, membranous wings 12-15 mm long. Surface fine furrowed, slight lustrous, brown, black spotted, with a marginal brim. 2n = 24.** Originally growing in North America, one of the economic important species, resistant to climatical changes, insects and elemental calamities; often planted in forest, parks, gardens. Br, Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**46. *Pinus sylvestris*** L. – Tree, up to 40 m high, corona conical, regular, irregular later on umbrelloidal flattened, bark bursted in the lower part of the trunk. **Seeds prolonged ovate to ellipsoid, 3-5 x 2.2-3.5 mm, wings membranous 10-15 mm long. Surface nigrescent or grey, wings shiny brown. 2n = 24.** Native to Eurasia; commonly cultivated in forest and parks in many cvs for timber, resistant to frost, drought and various ecological impacts; in all Carpathian regions.

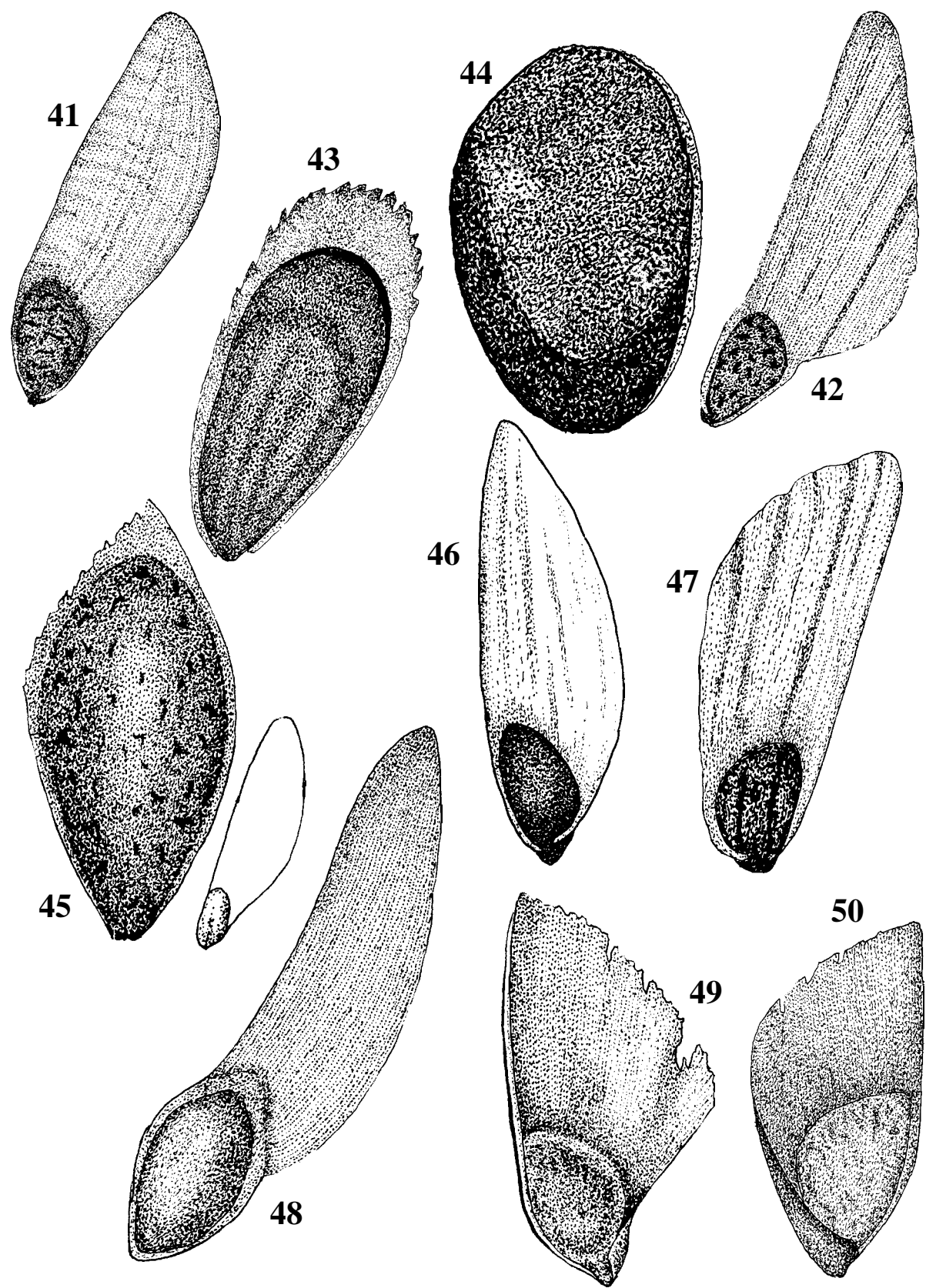
**47. *Pinus uncinata*** Mill. ex Mirb., *P. uliginosa* Neumann – Tree, up to 10 m high, trunk erect, corona aerial, broadly ovoid. **Seeds globose-trigonal, apex aslant-rounded, base rounded, 4-6 x 2-3 mm, membranous wings 7-10 mm long. Surface fine tuberculate, dull, blackish-brown to black.** Native to higher mountains of western Europe, on calcareous and dolomite; in the Carpathians rarely grown in parks. Pl, Sk.

**48. *Pinus wallichiana*** Jacks., *P. excelsa* Wall. non Lam. – Tree, up to 50 m high, corona wide pyramidal, bark grey, smooth. **Seeds elliptic-obovoid, compressed, apex and base narrowed, biconvex, 8-10 x 5-6 mm, prolonged wings 24-30 mm long. Surface smooth to faint foveolate, dull, brown.** Originally growing in the Himalayas, in 1800-4000 m elevation, very durable wood; most beautiful, extraordinary decorated; in the Carpathians rarely cultivated in parks. Br, Hu.

**49. *Larix decidua*** Mill., *L. europaea* DC. – Tree, up to 35 m high, corona conical, aerial, bark smooth, greenish-yellow, greyish-yellow later on. **Seeds triangular-ovate, apex aslant truncate to slight rounded, base fixed in the lower part of the wing, 3.7-4.3 x 2.2-2.5 mm, membranous wings 3-5 mm long. Surface smooth, dull, whitish, with reddish-brown spots, wings reddish-brown. 2n = 24.** Native to mountains of Europe, in light woodlands, susceptible to pollution; cultivated as ornamental in forests, parks, gardens, town-verdure. Br, Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**50. *Larix polonica*** Racib., *L. decidua* Mill. subsp. *polonica* (Racib.) Domin – Tree, up to 30-40 m high, with upright stem, ripened cones 2-3 cm, ovoid- globose. **Seeds obovoid, slight compressed, 3-4 x 2-3 mm, wings 4.3-5.7 x 4-4.5 mm. Surface smooth, lustreless, pale-brown, wings reddish-brown. 2n = 24.** Native to the Carpathians,





in dwarf pines, submontane and montane zones. Cz, Pl, Ro, Sk, Uk.

**51. *Larix sibirica*** Ledeb. — Tree, up to 40 m high, very similar to *L. decidua*. **Seeds triangular-oval, apex aslant round, base narrowed, fixed in the lower part of the wing, 3-4 x 2.2-2.4 mm, membranous wings 4-5 mm long. Surface smooth, dull, whitish, spotted less or more, reddish-brown. 2n = 24.** Native to northern Russia and Siberia; very seldom planted in European parks and arboretums. Br, Cz, Mo, Pl, Uk.

**52. *Pseudolarix kaempferi*** (Lam.) Gord., *Larix leptolepis* (Siebold et Zucc.) Gord., *L. kaempferi* (Lam.) Carr. — Tree, up to 30 m high with red-brown horizontal branches. **Seeds triangular to obovoid, apex slight aslant truncate, base conical, 4.2-4.8 x 2.4-2.6 mm, membranous wings 5-7 mm long. Surface smooth, dull, spotty, faint reddish-brown, wings brown.** Native to Japan, very valuable woody trees; rarely cultivated (for timber) in forests, as ornamental in parks and arboretums. Br, Cz, Sk, Uk.

**53. *Chrysolarix amabilis*** (Nels.) Moore. — Tree, leaves 4-7 x 2-3 mm, bluish-green, bud scales acuminate. **Seeds irregular oval, apex slight aslant truncate, base fixed in the lower part of the wings, 7-8.5 x 5-5.5 mm. Surface smooth, dull or faint lustrous, whitish, membranous wings terracotta-brown.** Native in China; in the Carpathians very rarely cultivated in parks and arboretums.

**54. *Cedrus atlantica*** Manetti — Tree, up to 40 m, with a stiffly leading shoots, young twigs downy. **Seeds cuneiform, apex aslant-rounded, base narrowed, 10-12 x 5.5-6.5 mm, membranous wings 15-20 x 15-20 mm. Surface faint pitted, dull, brown, with pitch dark-brown islands, wings tight fitting to seeds.** Originally growing in north Africa in the Atlas Mountains, 1500-2500 m; very decorative, relative often cultivated for timber; in the Carpathians rarely in parks and arboretums. Cz, Hu, Ro, Sk, Uk.

**55. *Cedrus deodara*** (D. Don) G. Don fil. — Tree, up to 60 m or more, with a pendent shoots, twigs dense hairy. **Seeds triangular to elliptic, flattish, apex aslant truncate, base narrowed, 12-16 x 6-7 mm, wings 16-22 x 20-25 mm. Surface smooth, dull, with pitch faint lustrous islands, pale-brown.** Originally growing in the mountains of the Himalayas; cultivated in south Europe for timber; in the

Carpathians very rarely planted in parks and gardens as a decorative tree. Uk.

**56. *Cedrus libani*** A. Rich. — Tree, up to 40 m high, corona wide extended. **Seeds triangular, flattish, apex aslant truncate, base narrowed, 10-13 x 4-5 mm, membranous wings 12-15 x 15-18 mm. Surface slight foveolate, dull, brown, with pitch lustrous islands, wings light brown.** Originally growing in the Asia Minor at elevation of 1300-2000 m; important in furniture industry for its hard and durable wood; in the Carpathians frequently grown in parks as ornamental. Uk.

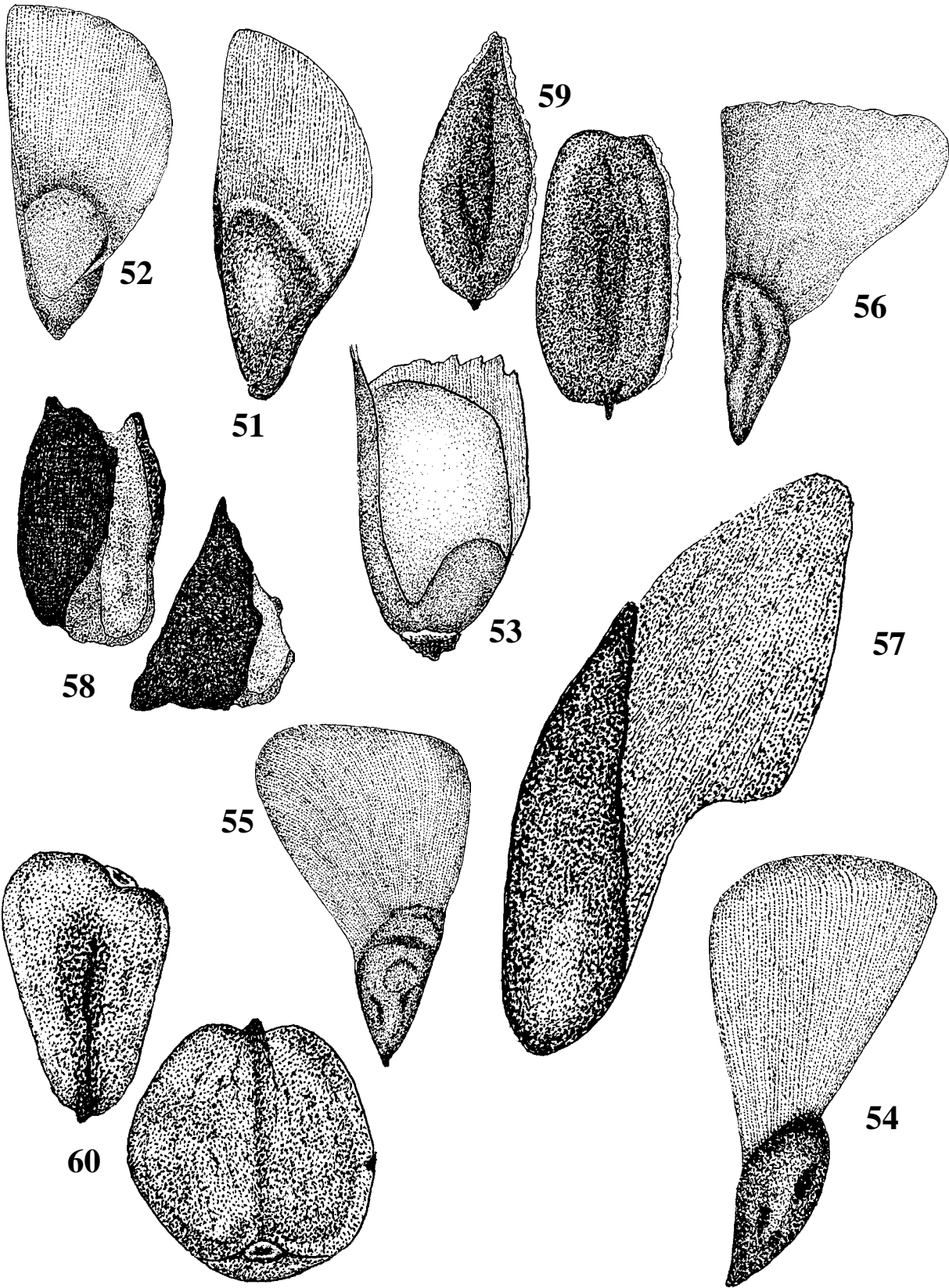
**57. *Libocedrus decurrens*** Torr. — Tree, up to 15-20 m high, corona rounded, branches flattened, lustrous, covered with dark-green scales in whorls of 4. **Seeds prolonged ovoid, apex ± acute, with large semimembranous wings, 14-18 x 6-8 mm. Surface smooth, lustreless, brown.** Originally growing in North America, on steppes in warmer areas; in the Carpathians rarely planted in parks and botanical gardens.

## 5. TAXODIACEAE

**58. *Taxodium distichum*** (L.) Rich. — Tree, up to 30-40 m high with a conspicuous pyramidal, widely extended corona, bark brown-red, cones nearly round, the surface wrinkly. **Seeds formed irregular (mostly triangular, rhombic), 10-12 x 5.5-7 mm. Surface smooth, dull, pale-terracotta and dark-purple. 2n = 22.** Originally growing in North America, in swampy virgin forest and river valleys; in the Carpathians often cultivated in parks, arboretums, botanical gardens on waterlogged grounds. Cz, Hu, Ro, Sk, Uk.

**59. *Cryptomeria japonica*** (L. fil.) D. Don — Tree, up to 20-45 m, corona wide conical, branches upright with a reddish-brown bark. **Seeds shaped very irregular, mostly prolonged ellipsoid, cuneiform, trigonous, apex and base apiculate, truncate, rounded, dorsal side rooflike, ventral flat, wings narrow, 5-7 x 2-3 mm. Surface fine tuberculate, lustrous, brown to dark brown, wings paler.** Originally growing in Japan, China, at 600-1200 m elevation in damp climate; in the Carpathians rarely planted in parks as ornamental.

**60. *Sequoia sempervirens*** (D. Don) Endl. — Tree, up to 100 m high, corona irregularly wide, conical, branches horizontal. **Seeds shaped irregular, mostly oval, obovoid, globose, strong compressed, dorsal**



side convex, ventral concave, thickly winged, 4.4-5 x 2.8-3.2 mm. Surface smooth, dull or faint lustrous, reddish-brown. Originally growing in North America; in the Carpathians seldom planted in parks for ornament.

61. *Sequoiadendron giganteum* (Lindl.) Buchholz, *Sequoia gigantea* (Lindl.) Decne. – Tree, up to 70-90 m high, trunk upright, very strong, bark red-brown. **Seeds prolonged ellipsoid with wings, 5-6.2 x 4-4.6 mm (proper seed only 1-1.5 mm broad). Surface smooth or faint foveolate, lustrous, dark-brown, wings pale-brown.** Originally growing in North America; in the Carpathians often cultivated in parks in warmer areas as an interesting tree. Hu, Ro, Sk, Uk.

62. *Metasequoia glyptostroboides* Hu et Cheng – Tree, up to 35 m high, corona pyramidal at young stage, lay-out later on. **Seeds globose, strong compressed, dorsal side convex, ventral concave, with two dark-brown spots in the middle, margin winged cut out in the upper part, 4-5 x 4-5 mm. Surface smooth, dull, pale-brown. 2n = 24.** Originally growing in south China; in the Carpathians often planted in parks, arboretums, botanical gardens on damp soils, rarely experimentally in woods.

## 6. CUPRESSACEAE

63. *Cupressus sempervirens* L. – Tree, up to 15-25 m high, corona slender, pyramidal, branches grey-brown and square. **Seeds formed irregular, mostly ellipsoidal, rhomboidal, 4-6 x 3-4 mm. Surface fine foveolate, dull, with an indistinct lateral or all-round wing-like margin, violet-brown.** Originally growing in the eastern Mediterranean and the Himalayas; planted in the Carpathians in parks, gardens, arboretums for many years, especially in Cz, Hu, Ro, Sk, Uk.

64. *Chamaecyparis lawsoniana* (A. Murray) Parl., *Cupressus lawsoniana* A. Murray – Tree, up to 40-50 m high, corona narrow, conical, lateral branches in horizontal position, cones round. **Seeds irregular oval to globose, with lateral wings, 4.3-4.7 x 3.4-4 mm. Surface faint longitudinal furrowed in the middle, dull, brown, both lateral wings leatherish, paler. 2n = 22.** Originally growing in North America; grown in many cvs in forests for timber and in parks, gardens as a decorative tree, as a solitary or in groups. Br, Cz, Hu, Mo, Ro, Sk, Uk.

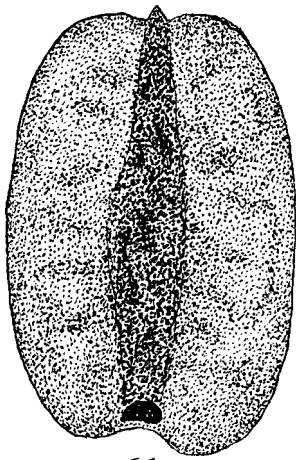
65. *Chamaecyparis nootkatensis* (D. Don) Spach., *Cupressus nootkatensis* D. Don – Tree, up to 25 m, corona narrow, conical, densely branched. **Seeds cordate or oval to globose, lateral compressed, two lateral wings, 5-6 x 4.8-5.2 mm. Surface fine longitudinal furrowed in the middle, dull, brown, both lateral wings leathery, pale. 2n = 22.** Native to mountain hillslopes of the western coast of North America, up to 1200 elevation, very decorative in many forms, frost-resistant; cultivated in parks and gardens, especially as a solitary. Cz, Hu, Ro, Sk, Uk.

66. *Chamaecyparis obtusa* (Siebold et Zucc) Siebold et Zucc., *Retinospora obtusa* Siebold et Zucc. – Shrub or tree, up to 20-30 m high, corona broadly conical. **Seeds irregular globose, two lateral wings, 3.5-4 x 3.3-3.7 mm. Surface faint longitudinal furrowed in the middle, brown, lateral wings wrinkly, paler.** Originally grown in Japan, 400-1000 m elevation, fairly hardy species; in the Carpathians mostly as an ornamental and solitary in gardening.

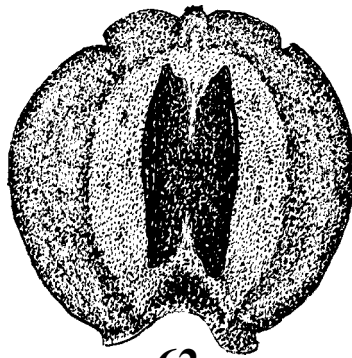
67. *Chamaecyparis pisifera* (Siebold et Zucc.) Siebold et Zucc., *Retinospora pisifera* Siebold et Zucc. – Tree, up to 20 m high, corona conical, sparse, branches horizontal or slightly pendulous. **Seeds irregular globose to oval, with lateral wings, 2.6-3 x 3.8-4.2 mm. Surface fine longitudinal furrowed in the middle, with some pitchy glands, slight lustrous, dark-brown, two lateral membranous wings light-brown. 2n = 22.** Native to Japan, frost-resistant, non-demanding in the Carpathians planted in parks, gardens as a solitary or in free groups. Br, Cz, Hu, Mo, Ro, Sk, Uk.

68. *Chamaecyparis thyoides* (L.) Britt., *Cupressus thyoides* L. – Shrub or tree, up to 25 m high, corona conical, bark red-brown, scaled cones somewhat fleshy and wrinkled. **Seeds irregular globose, lateral wings, 2-2.5 x 2-2.5 mm. Surface longitudinal furrowed in the middle, wings wrinkly, lustrous, dark-brown. 2n = 22.** Originally growing in North-American marshes; in the Carpathians used in gardening as solitary.

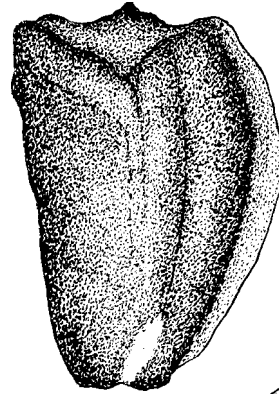
69. *Thuja occidentalis* L., *T. odorata* Marsh – Shrub or tree, up to 20 m high, corona conical, branches horizontal, flat, cones oblong, stand erect on branches. **Seeds ellipsoid, compressed lateral, with broad lateral wings, 5.8-6.2 x 2.9-3.1 mm. Surface rumpled, brown, lustrous, membranous wings pale. 2n = 22.** Native to Canada and the north-eastern part of the USA where it grows on moist



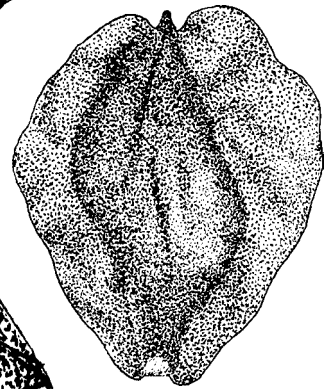
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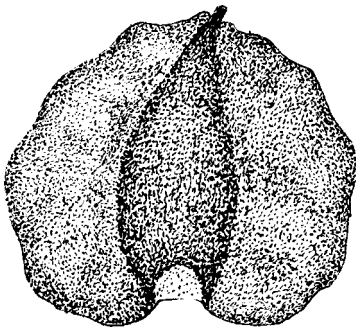
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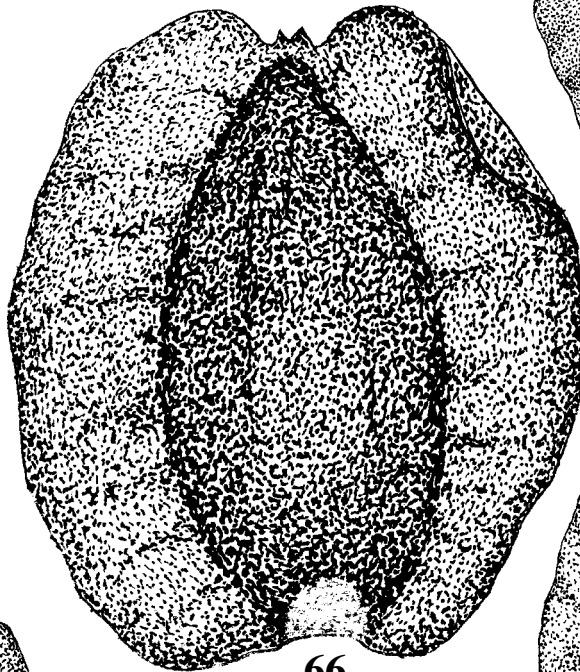
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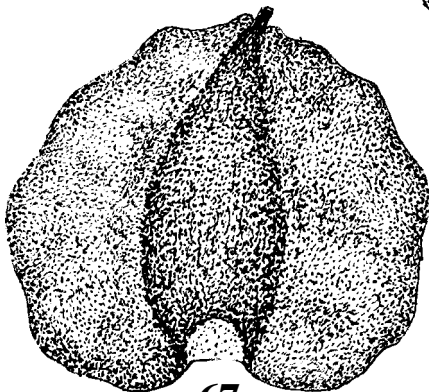
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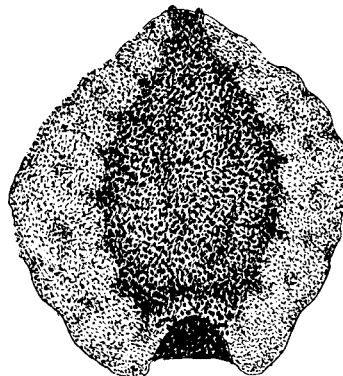
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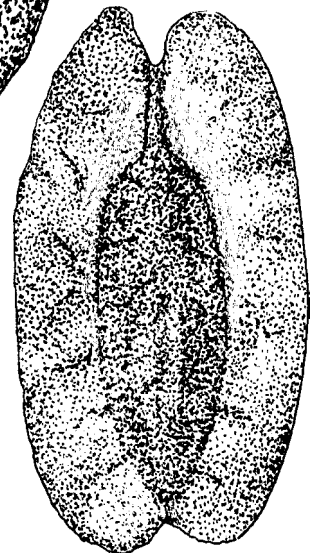
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and marshy grounds; in the Carpathians cultivated in many ornamental forms in gardening.

**70. *Thuja plicata*** D. Don, *T. gigantea* Nutt. – Tree, up to 40-60 m high, coronas pyramidal, branches short, horizontal, bark smooth, brown. **Seeds ellipsoid, lateral flattish, lateral wings, 5.3-6 x 2.8-3.2 mm. Surface faint furrowed longitudinal, lustrous, dark-brown, two membranous wings wrinkly, light-brown. 2n = 22.** Originally growing in North America, on swamp and wet grounds; in the whole Carpathians commonly planted in parks, cemeteries, seldom cultivated for timber.

**71. *Thujaopsis dolabrata*** (L. fil.) Siebold et Zucc. – Shrub or a smaller tree, broadly conical tree, up to 10-20 m high, with long, pendulous branches. **Seeds ovoid or ellipsoid, dorsal side convex, ventral flat, two marginal wings, 4.2-4.8 x 3-3.5 mm. Surface rough wrinkly, longitudinal fine furrowed, brown, wings pale-brown. 2n = 22.** Originally growing in Japan up to 2000 m elevation, in pure or mixed forests; in the Carpathians rarely cultivated for timber (used for water buildings) and as decorative tree in parks.

**72. *Platycladus orientalis*** (L.) Franko, *Biota orientalis* (L.) Endl., *Thuja orientalis* L. – Shrub or low tree, up to 10 m high, corona conical to oval, branches upright. **Seeds prolonged ovoid with a lighter bigger spot at the base, 5.2-6.2 x 3-3.6 mm. Surface faint longitudinal furrowed, slight lustrous, dark-brown. 2n = 22.** Native to northeastern China on hills and in mountains; in the Carpathians frequently cultivated for decoration in parks, gardens, cemeteries in many forms.

**73. *Juniperus chinensis*** L. – Shrub or tree, or up to 20 m high, in native country very various in form, generally shrubby. **Seeds hard-shelled, obovoid up to globose, 5-5.5 x 4-4.8 mm. Surface fine furrowed longitudinal, dull or slight lustrous, unicoloured, whitish-yellow or in combination with dark-brown. 2n = 44.** Originally growing in eastern Asia (China, Korea); in the Carpathians often cultivated in parks, gardens as ornamental in various cvs.

**74. *Juniperus communis*** L. – Shrub or tree, up to 10 m high, with prickly awl-shaped needles in the whorls of the tree, cones are blue, waxy covering. **Seeds hard-shelled, longish-ovoid or triangular, 4-5 x 2-3 mm. Surface tuberculate, dull, brown, with 2-4 lustrous, smaller or bigger pitching growths. 2n = 22.** Native to and common throughout

Eurasia and North America, mainly in higher mountains on poor soils, fewer in forest-steppes; seldom grown in parks and gardens in some cultivars; throughout the Carpathians.

**75. *Juniperus excelsa*** M. Bieb. – Shrub or tree, up to 20 m, with a conical corona when young, broad and open later. Twigs wide, terete, scaly. **Seeds hard-shelled, obovoid to ellipsoid, apex truncate with a large and deep invasion, 4.4-5 x 3-3.5 mm. Surface foveolate, slight lustrous, brown, unique bumpy.** Native to the Balkan Peninsula, the Asia Minor, on fierce slopes in uplands with calcareous soils; in the Carpathians rarely planted in rock-gardens.

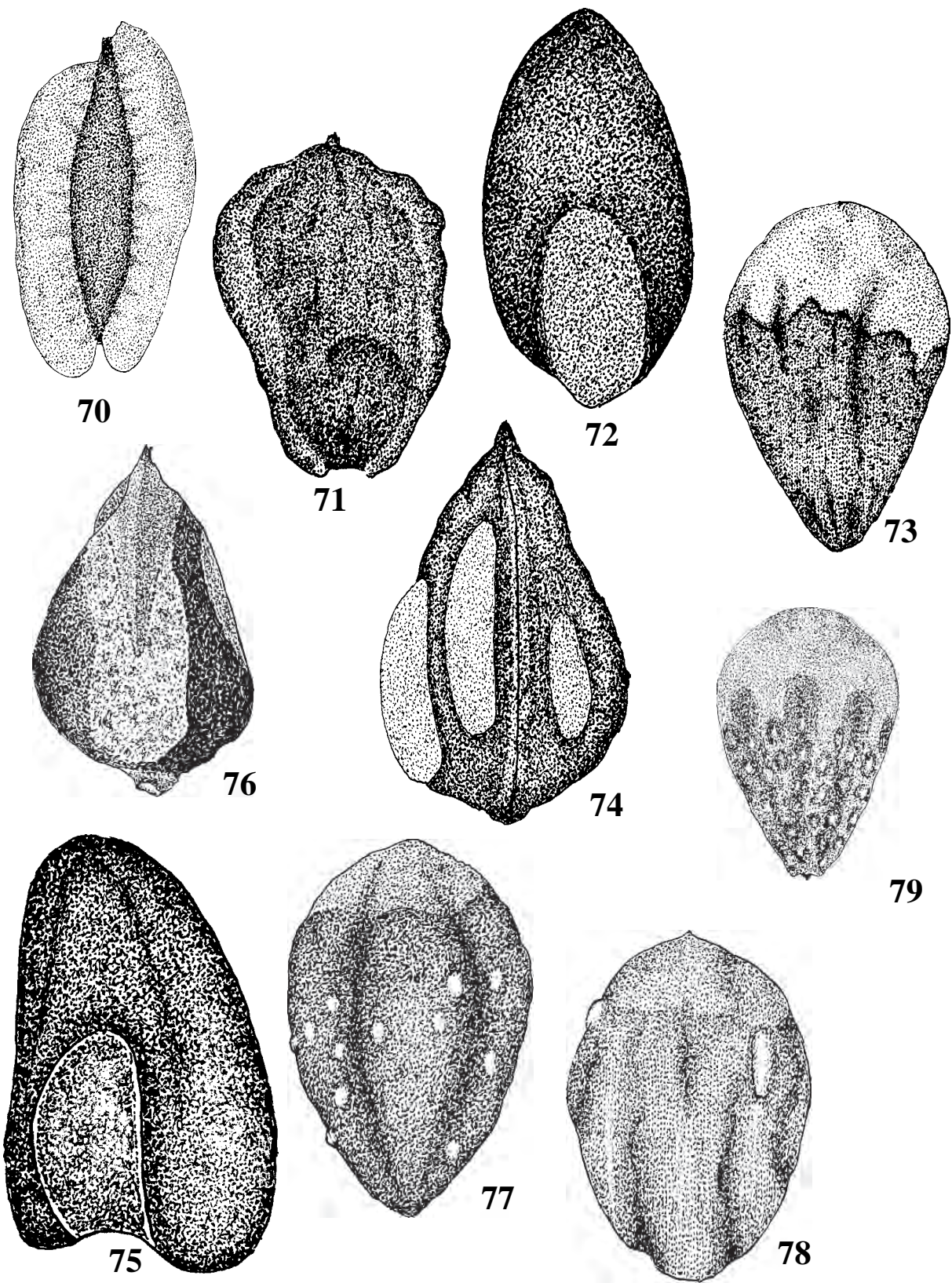
**76. *Juniperus oxycedrus*** L. – Shrub or tree, up to 14 m high, leaves with two glaucous bands above. **Seeds hard-shelled, obovoid or triangular, slight compressed, 6-7 x 4-4.5 mm. Surface coarse and dull in the upper and smooth and slight lustrous in the lower part, pale- and dark-brown.** Native to southern Europe on dry hills and mountains up to 1900 m elevation; in the whole Carpathians rarely planted in parks as ornamental in various cvs.

**77. *Juniperus sabina*** L., *Sabina officinalis* Garcke – Shrub, up to 3-5 m high, with a procumbent growth, rarely small tree, bark red-grey. **Seeds hard-shelled, obovoid, apex rounded or truncate, base narrowed, 3.7-4.5 x 2.5-3 mm. Surface grooved, smooth or grained with some pitch glands, lustrous, lower part reddish-brown, upper part whitish-brown. 2n = 22.** Originally in Eurasia and North America, in subalpine and alpine chains; in the Carpathians growing in gardens, parks as ornamental in some forms. Mo, Ro, Sk, Uk.

**78. *Juniperus sibirica*** Lodd., *J. alpina* Gray, *J. nana* Willd. – Shrub, up to 50 cm high, procumbent with short and strong branches, sometimes creating thick carpets. **Seeds hard-shelled, nearly globose to broad ellipsoid, 4.5-5 x 3-3.5 mm. Surface with some deep furrows, tuberculate, dull, unique with pitch glands, brown. 2n = 22.** Native to Euro-Siberia; in the Carpathians very scarce, in belts of *Pinus mugo* and higher on rocky grounds; grown in rock gardens. Pl, Ro, Sk, Uk.

**79. *Juniperus virginiana*** L., *J. arborescens* Moench – Shrub or tree, up to 15-25 m high, corona conical to broadly conical. **Seeds hard-shelled, obovoid, apex rounded, whitish-grey, lower part reddish-brown with numerous pitch**





glands, 3.5-4 x 2.4-2.8 mm. Surface upper part smooth and dull, lower part lustrous and deep pitted.  $2n = 22$ . Originally growing in eastern North America; in the Carpathians planted for timber in forests and also in parks, gardens, as a solitary in some cvs. Br, Hu, Mo, Ro, Sk, Uk.

## 7. EPHEDRACEAE

**80. *Ephedrea distachya* L.** — Shrub, up to 10-20 cm high, twigs straight or curved, about 2 mm thick. Seeds hard-shelled, prolonged ovate, planoconvex, apex narrow, base wide rounded, 4.8-5.4 x 2.5-3 mm. Surface fine furrowed longitudinal, slight lustrous, grained, brown to nigrescent.  $2n = 28, 36$ . Native to Europe, on sandbanks, rocky and solar stands; in the Carpathians very seldom. Hu, Ro, Sk, Uk.

## B. ANGIOSPERMAE

### 8. MAGNOLIACEAE

**81. *Magnolia acuminata* L.** — Shrub, or pyramidal tree, up to 20-25 m high with dark-brown bark. Seeds triangular-obcordate, base truncate, apex narrowed, more or less acuminate, 8-11 x 6-8 mm. Surface smooth or wrinkly, slight lustrous, reddish-brown, without a nigrescent pericarp.  $2n = 76$ . Originally growing in North America; one of the most beautiful ornamental tree, cultivated in warmer areas, in parks and gardens. Cz, Hu, Ro, Sk, Uk.

**82. *Magnolia denudata* Desr., *M. precia* Corr., *M. yulan* Desf.** — Shrub or up to 10-15 m high tree with large white flowers. Seeds trigonous, apex slight rounded, base narrowed, truncate on one lateral side, 9-11 x 11-13 mm. Surface of pericarps longitudinal furrowed, dull, dark reddish-brown.  $2n = 114$ . Originally growing in eastern Asia (China); a nice ornamental cultivated in parks and gardens, in warmer zones. Cz, Hu, Ro, Sk, Uk.

**83. *Magnolia grandiflora* L., *M. foetida* Sarg.** — Tree, up to 30 m high, corona pyramidal with white flowers. Seeds prolonged ellipsoid or obovoid, apex rounded or truncate, base slight narrowed, 12-14 x 6-8 mm. Surface of pericarps longitudinal furrowed, dull or faint lustrous, reddish-brown. Native to North America, a very attractive ornamental tree; in the Carpathians seldom cultivated in warmer areas in parks and town verdure.

**84. *Magnolia kobus* DC.** — Shrub or tree, up to 10 m high, corona pyramidal, dense, flowers white, pinkish at base. Seeds broad ellipsoid, lateral compressed, base truncate, apex slight rounded, 8-10 x 11-14 mm. Surface of the pericarps wrinkly, carmine-red, dull, lustrous.  $2n = 38$ . Originally growing in Japan, Korea, on hill slopes, frost-resistant; often cultivated in several cvs in parks of warmer areas. Ro, Uk.

**85. *Magnolia liliiflora* Desr.** — Shrub, up to 3 m high, twigs bare, leaves obovate, dark-green. Seeds broad ellipsoid, 9-11 x 10-15 mm. Surface of the pericarps longitudinal short furrowed, distinct wrinkly, dull, purple.  $2n = 38, 76$ . Originally growing in China; very nice, but also squeamish and therefore rarely cultivated in parks and gardens, only in the warmest areas of the Carpathians. Ro, Sk, Uk.

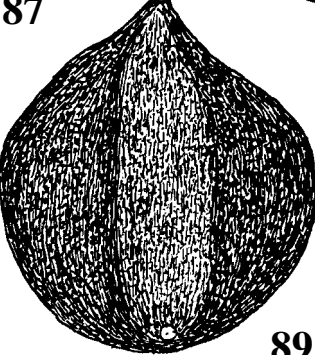
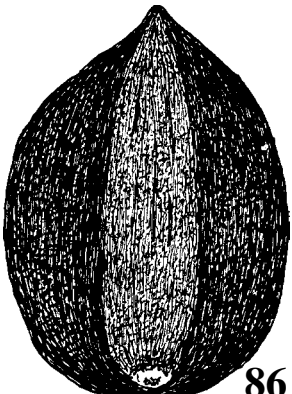
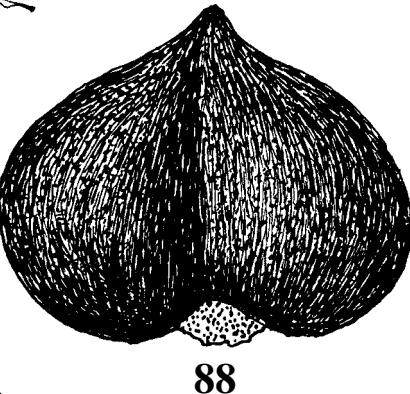
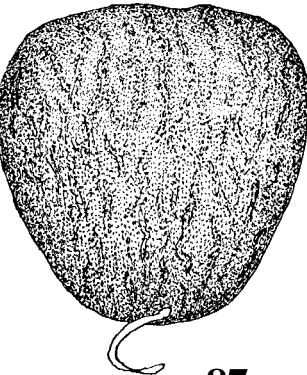
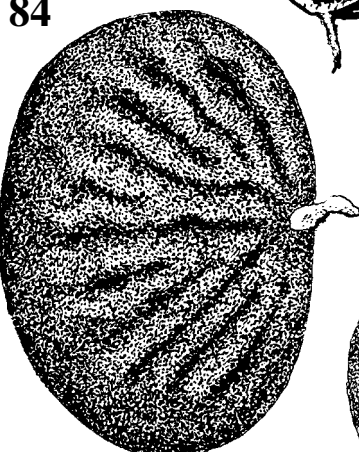
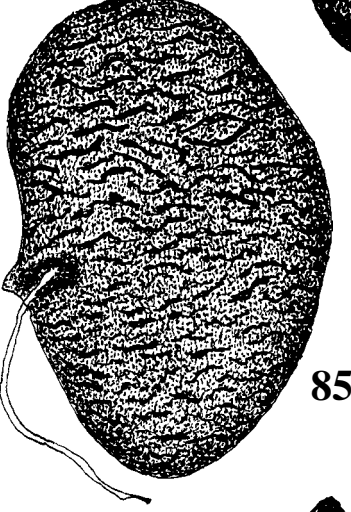
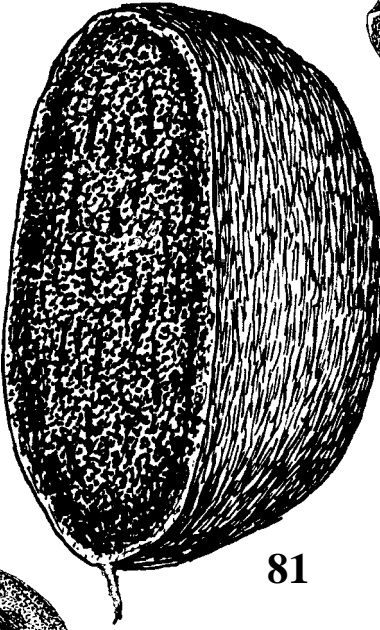
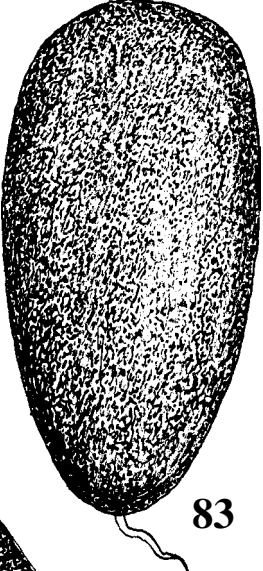
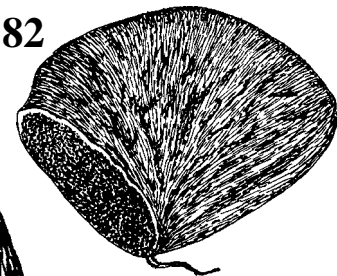
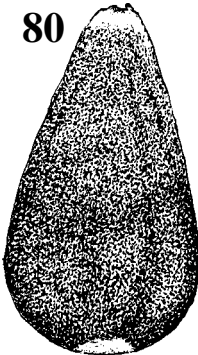
**86. *Magnolia obovata* Thumb., *M. hypoleuca* Siebold et Zucc.** — Tree, up to 20 m high, corona pyramidal, leaves deciduous, flowers large, white, odorous. Seeds obovoid to ellipsoid or obcordate, flattish, apex acuminate, base rounded or truncate, 9-13 x 5-6 mm. Surface of the pericarps longitudinal wrinkly, reddish-brown, slight lustrous, proper seeds nigrescent to black.  $2n = 38$ . Originally growing in Japan; highly decorative, often planted in parks. Ro, Sk, Uk.

**87. *Magnolia salicifolia* (Siebold et Zucc.) Maxim.** — Smaller tree, up to 10 m high, with prolonged ellipsoidal leaves. Seeds broad obovate, apex truncate, base narrow, rounded or truncate, 7.5-8.5 x 7.5-8.5 mm. Surface of the pericarps longitudinal furrowed, dull, terracotta, proper seeds slight lustrous, black, smooth. Native to Japan; rarely cultivated in parks and gardens as a decorative tree. Uk.

**88. *Magnolia stellata* (Siebold et Zucc.) Maxim., *Buergeria stellata* Siebold et Zucc.** — Shrub, up to 4 m high, slowly growing woody species. Seeds obcordate, flattish, apex acuminate, base truncate, 7-8 x 8-10 mm. Surface of proper seeds smooth or faint foveolate, black.  $2n = 38$ . Native to Japan; very decorative, flowering early in spring, mostly planted in gardens. Ro.

**89. *Magnolia tripetala* L., *M. umbrella* Lam.** — Tree, up to 12 m high with conspicuous large prolonged leaves, accumulated at the end of twigs. Seeds subglobose, apex slight truncate, base narrowed to acuminate, 7.5-9.5 x 7.5-8.5 mm. Surface of the pericarps





slight wrinkly, lustrous, reddish-brown, proper seeds longitudinal furrowed, nigrescent to black, dull.  $2n = 28$ . Native to the southeastern USA; scarcely planted in parks of the Carpathians.

**90. *Magnolia virginiana* L., *M. glauca* L.** — Shrub with deciduous leaves or tree, in warmer areas up to 20 m high with persistent leaves. **Seeds hard-shelled, broad ovoid, lateral compressed, apex narrowed, bottom with a large hilum, 6.5-7.5 x 6-8 mm. Surface smooth, lustreless, pale- or violetish-brown.** Native to the southern USA; in the Carpathians very rarely planted for its large and nice flowers in parks and gardens as ornamental.

**91. *Magnolia x soulangeana* hort. ex Thunb.** — Hybrid *M. denudata* x *liliflora*. Shrub or tree, up to 5-8 m high, corona broad, leaves obovate, flowers mostly whitish-rose to rose-purple. **Seeds obcordate, flattish, apex acuminate, base truncate, 8-9 x 9-11 mm. Surface of the pericarps carmine-red, slight wrinkly, without a pericarp nigrescent, faint foveolate, dull.  $2n = 76$ .** Originally growing in Japan, very decorative, usually cultivated in parks, gardens, town verdure in warmer areas. Cz, Hu, Mo, Ro, Sk, Uk.

**92. *Liriodendron tulipifera* L.** — Tree, up to 35 m high with a pyramidal corona. **Fruits like winged samaras, with long narrow wings, 1-2 seeded in the small cavity at the base, arranged conicform, 7-8 x 3.6-4 mm, seeds size is highly variable. Surface smooth or slight tuberculate, dull, bright-brown.  $2n = 38$ .** Originally growing in eastern North America; hardy enough and therefore often cultivated in the warmer parts of the Carpathians for timber and as an ornamental tree. Cz, Hu, Mo, Ro, Sk, Uk.

## 9. SCHIZANDRACEAE

**93. *Schisandra chinensis* (Turcz.) Baill.** — Trailing or creeping shrub up to 8 m high, having alternate, simple, subside leaves in autumn. **Seeds reniform, faintish depressed, 3.9-4.6 x 3-3.8 mm. Surface smooth, lustrous, cinnamon-brown.  $2n = 28$ .** Native to western China; in the Carpathians seldom planted in parks, at walls and fences, on warm, semi-shady places and good soils. Cz, Hu, Mo, Sk.

## 10. CALYCANTHACEAE

**94. *Calycanthus fertilis* Walter, *C. glaucus* Willd.** — Shrub, with deciduous leaves, flowers on the lateral twigs. **Seeds ellipsoid or obovoid achenes with a**

**lateral suture, at the apex with a small beak, 9-11 x 5-6 mm. Surface smooth, slight hirsute, slight lustrous, dark chocolate-brown.** Native to North America; in the Carpathians very rarely planted in parks as ornamental.

**95. *Calycanthus floridus* L.** — Shrub, up to 1-3 m high, with relatively few branches. **Seeds ellipsoid or prolonged obovoid with throughout hairy wing, 7.5-9.5 x 3.5-5 mm. Surface of proper seeds smooth or hairy, dull, dark-brown.  $2n = 22, 24, 33$ .** Originally growing in southeastern North America; for its interesting flowers very often cultivated as an ornamental in parks of the warmer areas of the Carpathians. Cz, Hu, Ro, Sk, Uk.

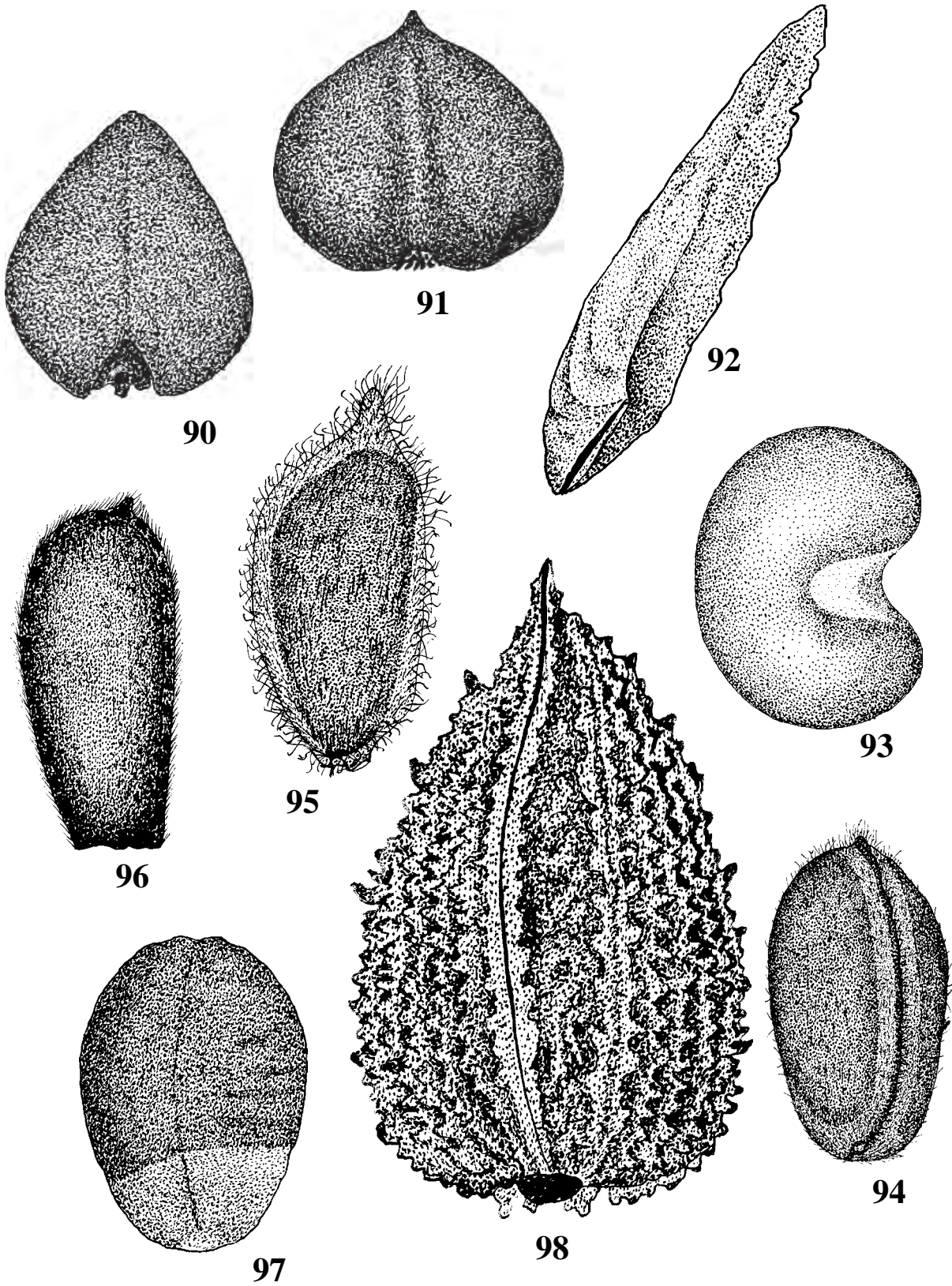
**96. *Calycanthus occidentalis* Hook et Arn.** — Shrub, up to 3 m high, with deciduous leaves, flowers on the short lateral twigs. **Seeds ellipsoid or prolonged, slight obovoid with throughout hairy wing, apex rounded with a small beak, bottom truncate, 10-12 x 4.4-5 mm. Surface smooth, slight lustrous, dark-chocolate brown, on wings and surrounding areas hirsute.** Native to California; in the Carpathians very rarely cultivated, mostly in botanical gardens.

## 11. LAURACEAE

**97. *Laurus nobilis* L.** — Shrub, up to 2-3 m high, with firm, aromatic persisting leaves. **Seeds obovoid to ellipsoid, 8-15 x 6-12 mm (wild shrubs) up to 15-20 x 10-13 mm (cultivated shrubs). Surface dense wrinkly, dull, olive-green to black, proper fruitlets darker in the upper than in the lower part, smooth, dull, brown or pale-brown.  $2n = 42$ .** Native in the Orient, Mediterranean species growing in lowland warm-moist deciduous forests; commonly cultivated for oil, widely used as a culinary article and in medicine, leaves are used as condiment, in cooler areas grown for decoration. Hu, Ro, Uk.

## 12. JUGLANDACEAE

**98. *Juglans cinerea* L.** — Tree, up to 30 m high, with grey, deeply furrowed skin. **Fruits nuts, ovoid-oblong with 4 prominent and 4 less prominent sharp ridges as well as many broken ridges between, 35-50 x 22-32 mm. Surface deep wrinkly, dull, dark-brown to nigrescent.  $2n = 32$ .** Originally growing in eastern North America, suitable for tree-rows, parks and forests on alluvial moisty grounds, good understock for *J. regia*; rarely cultivated in warmer areas. Br, Cz, Hu, Mo, Ro, Sk, Uk.



**99. *Juglans mandshurica*** Maxim. — Tree, up to 20 m high, corona wide, round, bark dark-grey. **Fruits nuts, near globular or oval, 30-50 x 20-30 mm. Surface with 6-8 surpassing, sharp ribs and deep sockets among them, acute on the top, dull, dark-brown to nigrescent.** Originally growing in Manchuria, Korea in mixed forests; rarely cultivated in parks and gardens in the eastern part of the Carpathians as ornamental. Br, Mo, Uk.

**100. *Juglans microcarpa*** Berl. — Small, shrubby, often several-stemmed tree, with a single trunk and narrow, round-topped corona, leaves with 15 to 23 leaflets. **Fruits nuts, having thin, rusty-brown, slight hairy epicarp, 13-20 mm in diam., nuts spherical, with longitudinal ridged or grooved shells, 13-18 mm in diam.** Native to North America; in the Carpathians very rarely cultivated in parks.

**101. *Juglans nigra*** L. — Tree, up to 50 m high with a furrowed brown bark. **Fruits nuts, orbicular or ovate, acute, strong ridge, 30-40 x 30-40 mm. Surface dull, not splitting, blackish-brown.  $2n = 32$ .** Native to eastern North America; often cultivated in forests for its costly wood used in furniture industry and also as excellent food for wild-beast, as well as a decorative tree in parks. Br, Cz, Hu, Mo, Ro, Sk, Uk.

**102. *Juglans regia*** L. — Tree, up to 30-40 m, high, with furrowed bark and dark-green, aromatic leaves. **Fruits walnuts, ovoid or wide, acute, wrinkly, easily splitting nuts, 25-50 x 20-40 mm. Surface dull, pale-brown, shell thin, especial in cultivated cultivars.  $2n = 32$ .** Native to east Mediterranean-Eurasia; widely cultivated for its fruits and timber, naturalized in warmer areas of the whole Carpathians.

**103. *Carya alba*** Nutt., *C. ovata* (Mill.) K. Koch — Tree, up to 40 m high, twigs light reddish-brown, bark rough, light-grey. **Fruits nuts, near roundish or slight ellipsoidal, apex with the rest of a style, faint compressed and angular, 30-60 x 25-40 mm. Surface smooth, 4-ribbed, lustreless, whitish or light-brown.** Native to the eastern USA, cultivated in orchards for nuts; in the Carpathians rarely cultivated in parks as an ornamental and interesting tree.

**104. *Carya amara*** Nutt., *C. cordiformis* K. Koch — Tree, up to 30 m high, bark light-brown, thinly scaled. **Fruits nuts, globose, slight flattish, irregular angular, apex with a thin beak, 22-28 x 22-32 mm. Surface slight reticulate, smooth, brown, shell thin, seeds bitter.  $2n = 32$ .** Native to North America,

planted for timber in forests; in the Carpathians very rarely planted in parks, recently time also in forests.

**105. *Carya glabra*** (Mill.) Sweet. — Tree, up to 40 m high, corona narrow with upright, thin twigs. **Fruits nuts, not ribbed, with thick shell, 25-35 x 22-26 mm. Surface faint undulate, sometimes with a roundish and pale spot, lustreless, dark-brown.** Native to southwestern North America growing on dry soils; in the Carpathians very rarely planted in forests and orchards, in warmer areas.

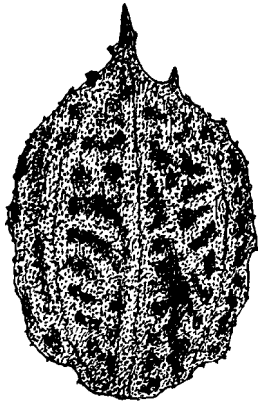
**106. *Carya illinoensis*** (Wangenh.) K. Koch, *Hicoria pecan* (Marsh.) Britt. — Tree, up to 50 m high, bark deeply furrowed. **Fruits nuts, ellipsoidal, apex acuminate, base rounded with a small hilum, 30-50 x 20-25 mm. Surface smooth, dull, dirty- or greyish-brown, with some prolonged blackish spots on the upper part.** Originally growing in the USA, commonly planted in commercial orchards, the best nut of all American species; in the Carpathians fairly squeamish, seldom planted in parks.

**107. *Carya laciniosa*** (Michx. fil.) Loudon, *C. sulcata* Nutt., *C. tomentosa* (Poir.) Nutt. — Tree, up to 40 m high, trunk bark nearly smooth, twigs pale-orange. **Fruits nuts, broad oval, slight flattish, apex with small beak, 26-30 x 26-36 mm. Surface with 4 ribs, shallow furrowed, dull, light-brown.  $2n = 32$ .** Originally growing in North America, cultivated for nuts; in Europe experimentally planted for its timber in forests.

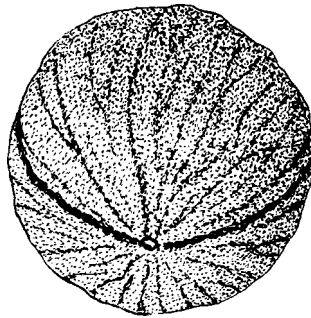
**108. *Pterocarya fraxinifolia*** (Poir.) Spach, *P. pterocarpa* (Michx.) Kunth — Tree, up to 30 m high, bark deep fissured. **Fruits achenes, of a particular shape with semiorbicular wings till 2 cm wide, 8-12 x 13-17 mm. Surface smooth, dull, dark-brown.  $2n = 32$ .** Native to the Caucasus and northern Persia, on moister localities, beautiful tree; seldom planted in warmer areas of the Carpathians, usually in parks. Cz, Hu, Mo, Ro, Sk, Uk.

**109. *Pterocarya rhoifolia*** Siebold et Zucc. — Tree, up to 30 m high, corona pyramidal, roundish, fertile racemes up to 30 cm long. **Fruits achenes, rhomboid with lateral lacinate wings, 25-35 x 10-15 mm. Surface smooth, slight lustrous, dark-brown.** Native to Japan, on riverbanks and valleys in leafy woods; in the Carpathians very rarely planted in parks as ornamental.

**110. *Pterocarya stenoptera*** DC., *P. sinensis* hort. — Tree, up to 30 m high, corona broadly pyramidal,



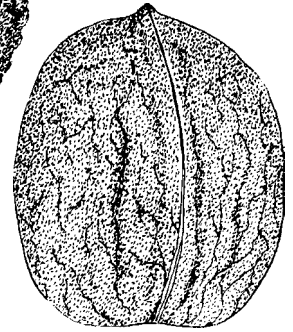
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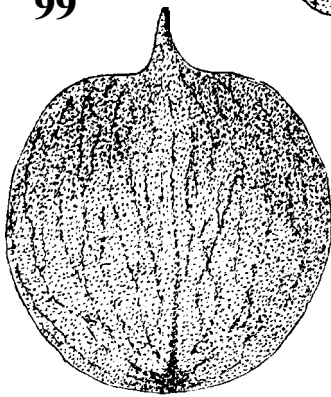
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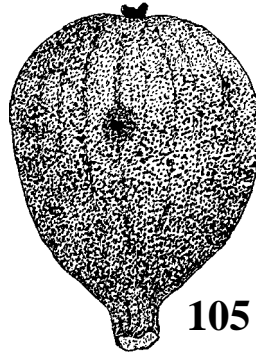
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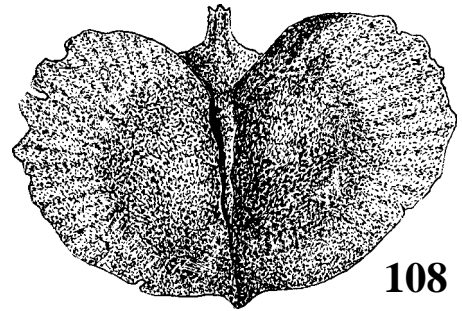
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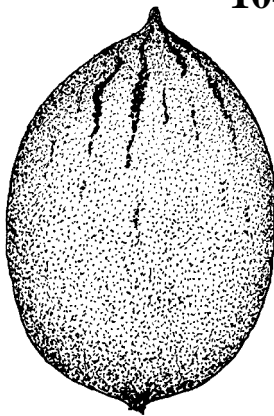
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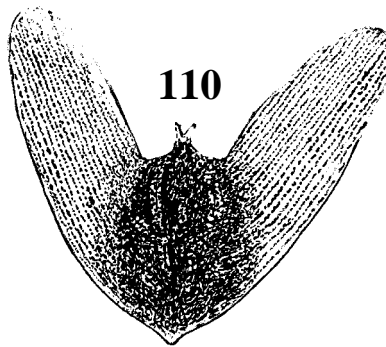
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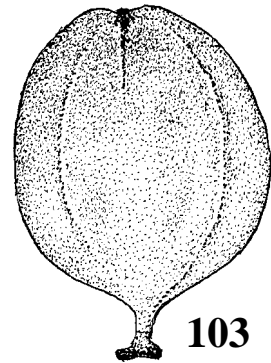
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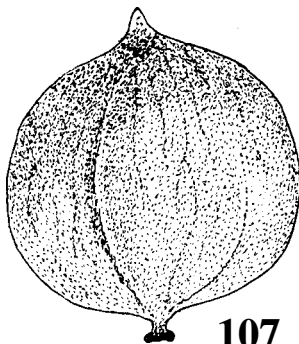
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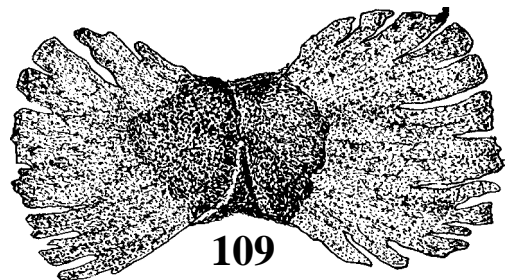
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109



leaves dark-green, lustrous, fertile racemes 20-30 cm long. **Fruits achenes, double-winged, apex with rest of style, 18-20 x 20-24 mm. Surface faint undulated, slight lustrous, wings faint grooved, pale-brown.** Native to China, squeamish species growing in valleys of mountain rivers, in leafy and mixed woods; in the Carpathians very rarely planted in parks as interesting species.

### 13. CERCIDIPHYLLACEAE

**111. *Cercidiphyllum japonicum*** Siebold et Zucc. — Appealing tree of pyramidal growth, 10 sometimes to 30 m high. **Seeds rhomboid, with long, rounded membranous wings at the apex c. 1.6-2 x 1-1.5 mm. Surface reticulate-foveolate, lustrous, light-brown, wings pale.** Native to Japan; in the Carpathians seldom cultivated as ornamental in parks of warmer climate.

### 14. MYRICACEAE

**112. *Gale palustris*** (Lam.) Chev., *Myrica gale* L. — Shrub, up to 1.5 m high, usually dioecious, twigs glabrous. **Stones of irregular shape, apex with three beaks, in the middle beak with the rest of a style, base narrowed, 2.4-2.7 x 1.9-2.1 mm. Surface smooth, dull, partial covered with a glossy wax high lustrous granules, yellowish-brown.** Native to northern Europe growing on heaths and peatbogs; rarely cultivated in parks. Pl.

### 15. BETULACEAE

**113. *Betula carpatica*** Waldst. et Kit. — Shrub or tree, up to 8 m high, young twigs glabrescent, corona irregular. **Fruits samaras, 2 wings near as wide as the seed or narrower, usually not reaching the stigmas, 3-3.5 x 4-4.6 mm. Surface fine foveolate, lower part of the proper seed darker, yellowish-brown, membranous wings light-brown. 2n = 42, 56.** Native to the mountains of central Europe, on peatbogs. Cz, Pl, Ro, Sk.

**114. *Betula dahurica*** Pall., *B. maackii* Rupr., *B. wutaica* Mayr. — Ornamental tree, up to 20 m high, with reddish to brown bark, loosening in small scales. **Fruits samaras, ± roundish or slight ellipsoid, lateral strong compressed, with stigmas at apex, semitransparent winged on both sides, 3.7-4.3 x 3.5-4.1 mm. Surface longitudinal fine furrowed, slight lustrous, brown, wings pale-brown.** Native to northeastern Asia, Japan; in the Carpathians rarely cultivated in parks. Br.

**115. *Betula ermanii*** Cham. — Tree, up to 20 m high, bark whitish, grey or reddish, twigs mostly glandular. **Fruits samaras, ellipsoid, apex and bottom narrowed, wings semitransparent, 2.5-2.9 x 2.7-3.1 mm. Surface slight lustrous, brown, membranous wings pale.** Native to the Kamchatka, Sakhalin, Japan; in the Carpathians very rarely planted for decoration. Br, Uk.

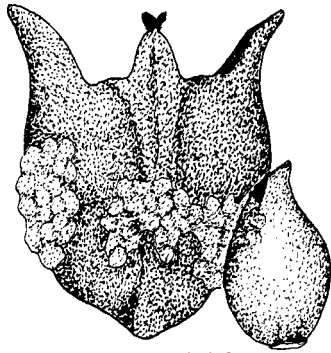
**116. *Betula humilis*** Schrank — Shrub, up to 2-3 m high, very branched, twigs verrucose, downy. **Fruits samaras, broad oval with narrow wings, proper seeds obovoid, base narrowed, 2.1-2.5 x 2.4-2.8 mm. Surface fine foveolate, slight lustrous, reddish-brown, stigmas black, hairy in the surrounding area, membranous wings paler. 2n = 28.** Native to central and eastern Europe, northern Asia, on peatbogs and fens. Br, Pl, Ro, Uk.

**117. *Betula lenta*** L., *B. carpinifolia* Ehrh. — Tree, up to 25 m high, corona spreading, round-topped, often several trunked, bark reddish-brown. **Fruits samaras, cordial or obtriangular, planoconvex, flattish, apex truncate, base narrowed, winged, 3.9-4.3 x 3-3.3 mm. Surface foveolate, slight lustrous, pale-brown, membranous wings light-brown, 1/2 of the seed width. 2n = 28.** Native to North America; planted for timber and in parks, mostly as a solitary, resistant against frost and pollution. Br, Mo, Uk.

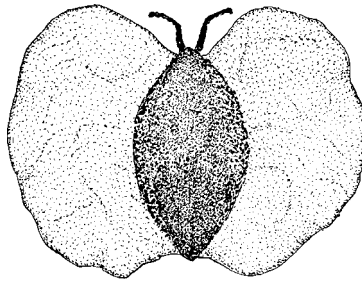
**118. *Betula litvinovii*** Doluch. — Shrubs, 10-15 m high, young twigs with glandular papillae, hairy, the beneath side of the leaves without hairs in the vein angles. **Fruits samaras, broad spindle-shaped, with broad wings, 2.3-2.7 x 3.7-4.3 mm. Surface fine wrinkly, lustreless, dark-brown, wings pale-brown.** Native to the eastern Europe, on chalky denudations. Uk.

**119. *Betula lutea*** Michx. — Tree, up to 30 m high, young twigs tomentose, bark yellowish or silverish-grey. **Fruits samaras, cordial, lateral compressed, apex ± truncate, bottom gradually narrowed, winged on both sides, 4.2-4.8 x 3.4-3.8 mm. Surface slight lustrous, pale-brown.** Native to North America; in the Carpathians rarely cultivated in parks. Br, Mo.

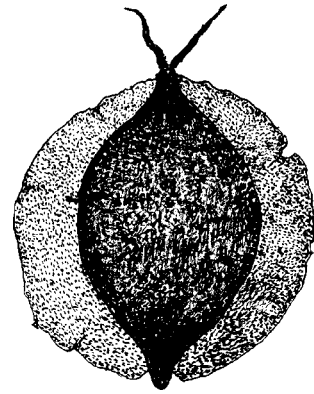
**120. *Betula nana*** L. — Tree, up to 50-100 cm high with spreading or procumbent branches, velvety, nearly hairless. **Fruits samaras, broad irregular, oval or obovoid, 2 wings, c. 1/6-1/4 as wide as the**



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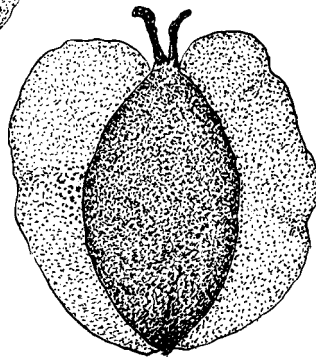
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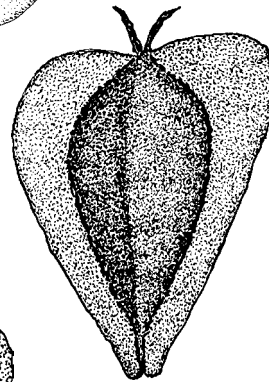
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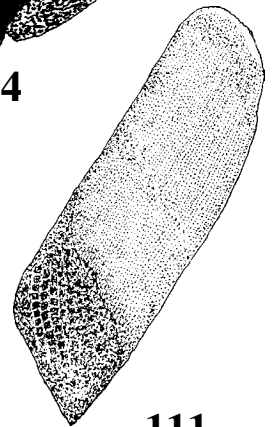
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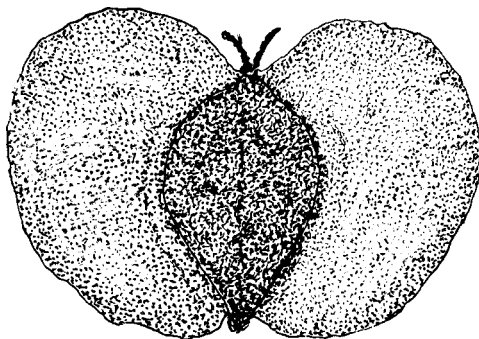
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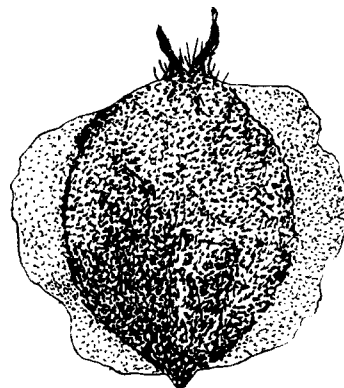
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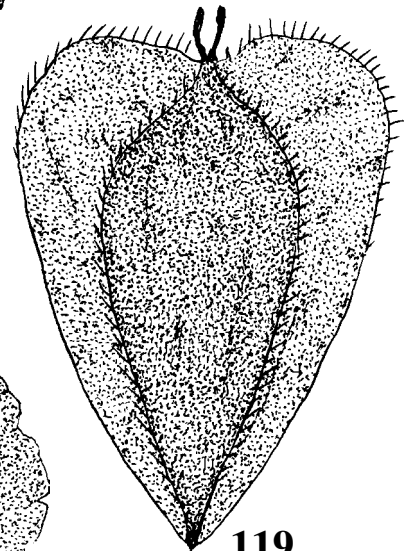
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119

seeds, 1.6-2 x 1.8-2.2 mm. Surface fine foveolate, slight lustrous, reddish-brown, wings translucent, light-brown, sparse hairy at the apex.  $2n = 28$ . Native to northern and central Europe, mainly in mountains, on peatbogs and fens. Br, Cz, Pl, Ro, Sk.

**121. *Betula obscura*** A. Kotula, *B. pendula* subsp. *obscura* (A. Kotula) Á. Löve — Shrub or tree, up to 9-12 m high, rhitidome light-brown or dark-brown, lustrous, black at the trunk base, leaves up to 10 cm long. **Fruits samaras, oblong obovoid, lateral compressed, broad winged, 2.8-3 x 3.2-3.4 mm. Surface fine undulate, faint lustrous, dark-brown, wings pale-brown.  $2n = 28$ .** Native to central Europe, on wet and waterlogged places, semidry swamps, wet and mixed woods; rare in the Carpathians. Pl, Sk, Uk.

**122. *Betula papyrifera*** Marsh. — Shrub or tree, up to 30 m high, often multi-trunked, bark white, paperly released. **Fruits samaras, broad ellipsoid, wings 1.5-2x as wide as the seeds, 2.3-2.7 x 3.5-4 mm, proper seeds size 1.8-2 x 0.9-1.1 mm. Surface fine longitudinal furrowed, slight lustrous, reddish-brown, wings translucent.  $2n = 84$ .** Native to North America, often planted in forests for good-quality wood; in the Carpathians often in parks as a nice decorative tree. Br, Cz, Sk.

**123. *Betula pendula*** Roth., *B. alba* auct. non L., *B. verrucosa* Ehrh. — Tree, up to 20 m high, trunk tall, bark white, resinous, twigs verrucose. **Fruits samaras, narrow elliptic or ovoid, 3.7-4.3 x 2.6-3.0 mm, proper seed in the middle part, 2.6-3 x 3.7-4.3 mm. Surface longitudinal faint furrowed, slight lustrous, reddish-brown, wings translucent, 2x broader than the seed.  $2n = 28$ .** Native to Europe, Asia Minor, in light forests on sandy and peaty soils; planted for timber. Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**124. *Betula pubescent*** Ehrh. — Tree, up to 20 m high, trunks slender, young twigs downy, without resinous warts. **Fruits samaras, obovate or elliptic, wings 1-1.5x wider than the seeds, 3.2-3.8 x 2.3-2.7 mm, proper seeds, 2.3-2.7 x 3.1-3.8 mm. Surface faint, longitudinal furrowed, dull, or slight lustrous, reddish-brown, wings translucent, light-brown.  $2n = 56$ .** Native the whole Euro-Siberia, forming extensive woodlands or scrubs, commonly growing on peaty soils of mountain moorlands; in the whole Carpathians.

**125. *Duschekia alnobetula*** (Ehrh.) Pouzar, *Alnus viridis* (Chaix) DC., *A. alnobetula* (Ehrh.) Hartig —

Shrub, up to 0.5-3 m high, often branched from the earth, corona irregular. **Fruits samaras, obovoid to ellipsoid, membranous wings as wide as the seeds, 3-3.5 x 3-3.5 mm. Surface fine foveolate, lustrous, brown, membranous wings paler.  $2n = 28$ .** Native to the Alps and Carpathians, light demanding, frost resistant, in higher mountain positions. Cz, Hu, Pl, Ro, Sk, Uk.

**126. *Alnus glutinosa*** (L.) Gaertn., *A. vulgaris* Pers. — Tree, up to 25 m high, bark smooth, fissured, brown. **Fruits samaras, obovoid, circular or angular, flattish, apex tapering, base truncate, narrow winged, 2.5-3 x 2-2.3 mm. Surface faint foveolate, lustrous, brown, wings indistinct brown.  $2n = 28$ .** Native to Eurasia, common in lowland wet forests, near water streams or on wet grounds; throughout the Carpathians.

**127. *Alnus incana*** (L.) Moench, *A. lanuginosa* Gilib. — Shrub or tree, up to 20 m high, corona ovoid, bark smooth, young twigs pubescent. **Fruits samaras, obovate or almost circular, flattish, narrow winged, 2.5-3 x 2.3-2.6 mm. Surface slight tuberculate, glossy, reddish-brown.  $2n = 28$ .** Native to Euro-Siberia, in the submontane zone, up to 1200 m elevation, near water streams, frost resistant. Br, Cz, Hu, Mo, Pl, Ro, Sk, Uk.

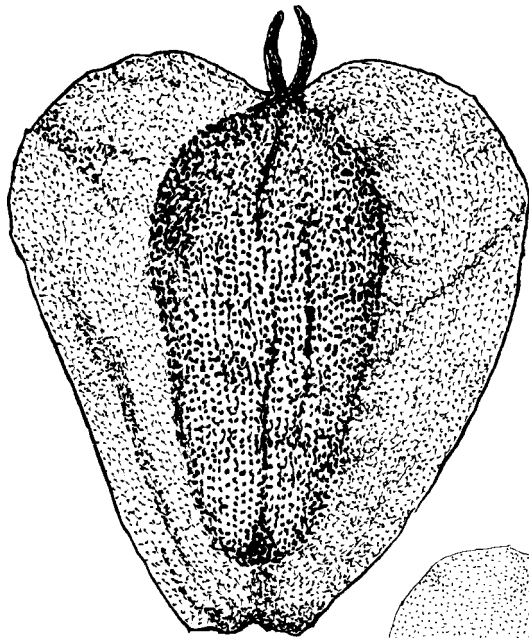
**128. *Alnus rugosa*** (Duroi) Spreng., *A. serrulata* Čelak. non Michx. — Shrub or tree, up to 10 m high, young twigs angular, downy, reddish-brown. **Fruits samaras, obovate, flattish, apex narrowed with the rest of stigmas, winged, 3-3.5 x 2.2-2.5 mm. Surface fine tuberculate, lustrous, reddish-brown, wings narrow.  $2n = 28$ .** Originally growing in North America, mostly along streams; frequently planted and naturalized mainly in central Europe. Pl, Sk.

**129. *Alnus x pubescens*** Tausch. — Shrub, hybrid from *A. glutinosa* x *incana*. **Fruits samaras, obovoid, lateral compressed, with indistinct intransparent wings, 2.5-3 x 2.3-2.7 mm. Surface fine longitudinal tuberculate, slight lustrous, brown. Native to Eurasia. Ro.**

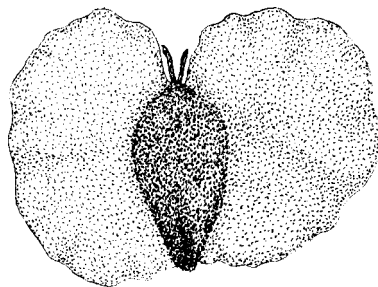
## 16. CORYLACEAE

**130. *Carpinus betulus*** L. — Tree, up to 25 m high, with a fluted, smooth trunk, young twigs downy. **Fruits nutlets, ovoid or oval, compressed, with 7-11 expressive ribs, apex with a torus, surrounded by bract, 6-9 x 5-6 mm. Surface smooth, slight**

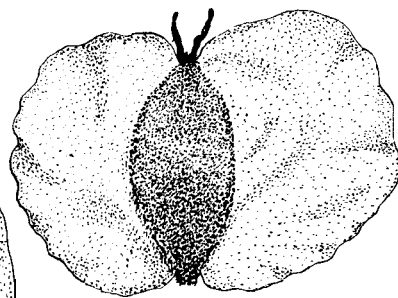




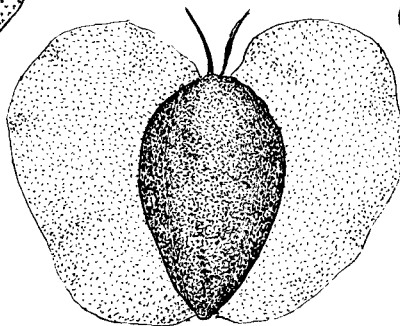
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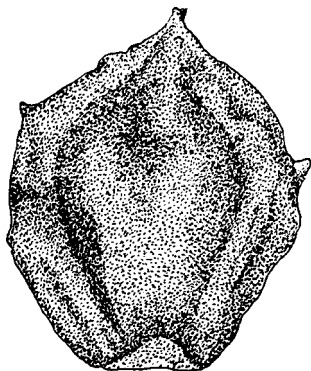
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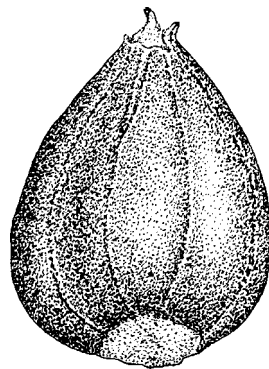
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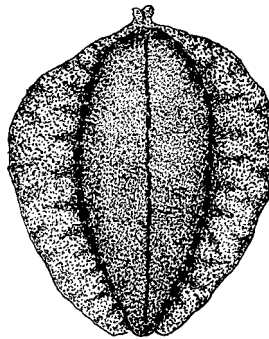
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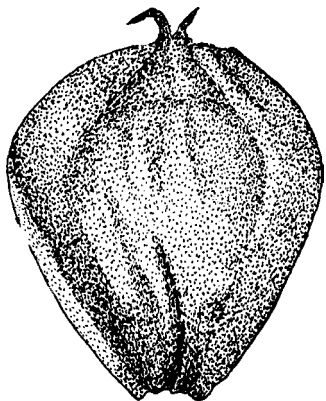
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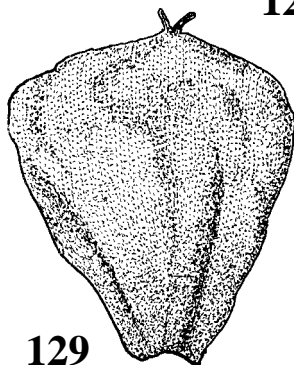
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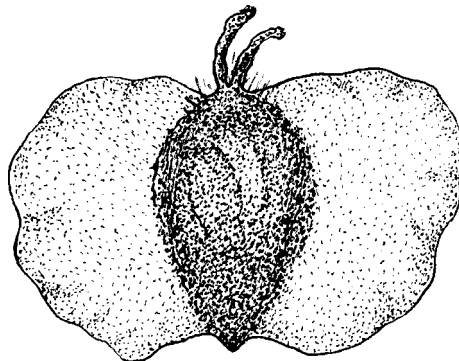
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124

**lustrous, greyish-brown. 2n = 64.** Native to Eurasia, in deciduous woodlands, shrubberies; common in woods and hedgerows in lowland and submontane zones; in the whole Carpathians.

**131. *Carpinus caroliniana* Walt.** — Tree, up to 12 m high, trunk 30-60 cm in diam., bark blue-grey, leaves elliptical. **Fruits nutlets, ovoid or pyramidal, gradually narrowed, with a crest on the apex, bottom truncate, with a large hilum, 5.8-6.2 x 3.8-4.2 mm. Surface biconvex, with 5 ribs on the dorsal side, ventral side with same shallow furrows, dull, greenish-brown or brown.** Native to North America, in moist and rich soil bordering streams or swamps; in the Carpathians rarely cultivated in parks.

**132. *Carpinus orientalis* Mill.** — Shrub or small tree, up to 5 m high. **Fruits nutlets, ovoid, slightly compressed, involucre distinct ribbed, 4-5 x 3-4 mm. Surface smooth, slight lustrous, green or dark-green. 2n = 16.** Native to southeastern Europe, forest undergrowth, especially on alkaline rocks; scarcely planted as ornamental in parks. Hu, Mo, Ro, Sk, Uk.

**133. *Ostrya carpinifolia* Scop., *O. vulgaris* Willd.** — Tree, up to 20 m high, with a brown fissured bark. **Fruits nutlets, enclosed by a bladder-like membranous involucre, ovoid or onion-shaped, compressed, apex tapering in a sharp angle, 5-6 x 2.5-3 mm. Surface of the sac covered by a drab network of veins, drab-ribbed, green to dark-brown. 2n = 16.** Native to southern Europe and Asia Minor; seldom planted in parks as ornamental. Hu, Ro, Sk, Uk.

**134. *Corylus americana* Walt.** — Shrub, up to 3 m high, young twigs downy. **Fruits nutlets, broad ellipsoid, slight lateral compressed, apex acuminate, base with large convex hilum, 10-15 x 12-18 mm. Surface smooth, dull or slight lustrous, greyish-brown. 2n = 22.** Originally growing in North America; in the Carpathians rarely planted in parks as a decorative shrub.

**135. *Corylus avellana* L.** — Shrub, up to 6 m high, bark greyish-brown, young twigs glandular-downy. **Fruits nutlets, globose or wide ovoid, with hard woody shell, apex tapering into a tip, hilum close to buff, 14-20 x 10-15 mm. Surface smooth, dull, orange-brown. 2n = 22.** Native to Europe, except the extreme north, often wide-spread in shrubberies, forest borders, riverbanks, from lowlands up

to 1200 m elevation; cultivated in gardens for tasty oil-nuts, generous cvs with nuts c. 28 x 18 mm; throughout the Carpathians.

**136. *Corylus colurna* L.** — Tree, up to 20-25 m high, corona dense, pyramidal or broadly ovoid. **Fruits nutlets, globose, with woody pericarp, apex pointed, hilum large, 15-18 x 18-22 mm. Surface slight furrowed longitudinal, smooth, dull, brown, dirty-yellowish. 2n = 28.** Native to southeastern Europe and western Asia; frequently planted in parks as solitary and tree-rows. Br, Cz, Hu, Ro, Sk, Uk.

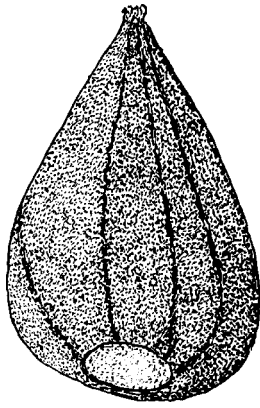
**137. *Corylus mandshurica* Maxim.** — Shrub, up to 3 m, strongly ramified. **Fruits nutlets, nearly globose or widely ovoid, slight lateral compressed, apex tapering into a tip, bottom slight convex, 14-15 x 12-14 mm. Surface smooth or fine furrowed, dull, pale-brown.** Native to the Far East, China, Korea, grows as undergrowth in coniferous and mixed woods, on wet grounds; in eastern Europe used as greening material in wood melioration. Br.

**138. *Corylus maxima* Mill., *C. subulosa* Willd.** — Shrub, rarely tree, up to 6-10 m high, young twigs glandular-downy. **Fruits nutlets, prolonged, ellipsoid or ovoid, apex narrowed, base convex, 18-25 x 10-15 mm. Surface shallow furrowed or smooth, slight lustrous, brown, apex and hilum greyish. 2n = 22.** Native to southeastern Europe, western Asia; planted in parks (also in var. *purpurea* Loud.), hybrids with *C. colurna* grown in orchards for fruits. Cz, Hu, Ro, Sk, Uk.

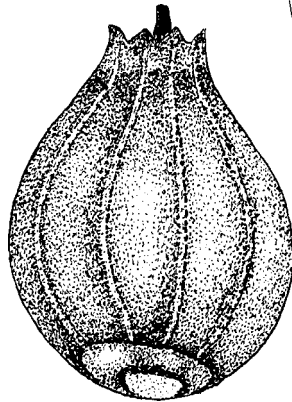
## 17. FAGACEAE

**139. *Fagus orientalis* Lipsky** — Tree, up to 40 m high, stronger, more mighty than *F. sylvatica*. **Fruits nuts, trigonal, with wings along all margins, 15-20 x 9-12 mm. Surface like in *F. sylvatica*.** Native to the eastern half of the Balkan Peninsula as far as Persia, at lower elevations and shattered localities; in the Carpathians seldom planted in parks. Mo, Ro, Uk.

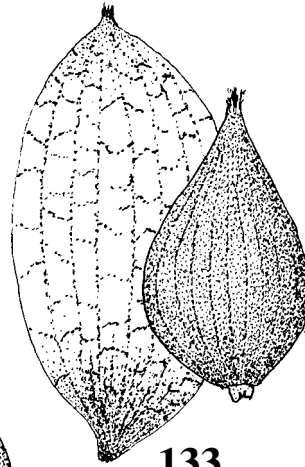
**140. *Fagus sylvatica* L.** — Tree, up to 30 m high, trunk strongly ramified, expired in corona, bark greyish, smooth. **Fruits nuts, trigonal or ovoid, sides slight concave, margins sharp, apex elongated, acuminate in angles, winged at apex, hilum triangular at the base, 14-15 x 8-9 mm. Surface smooth, slight lustrous, glabrous, cinnamon-brown. 2n = 24.** Native to the submontane forests of western and central Europe, 300-1300 m; costly economic and



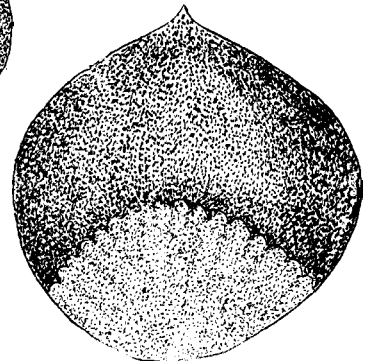
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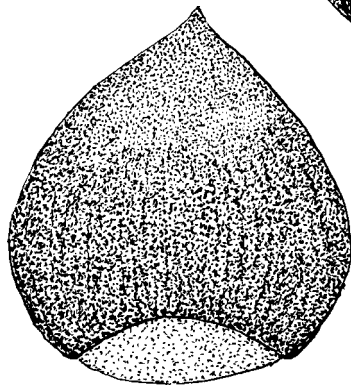
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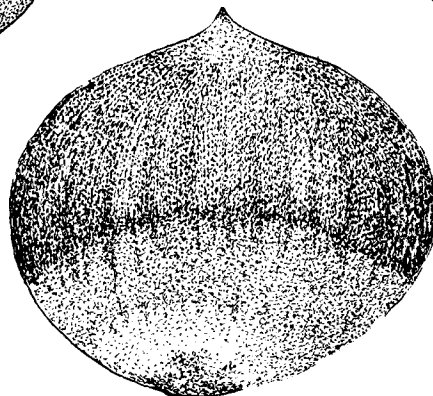
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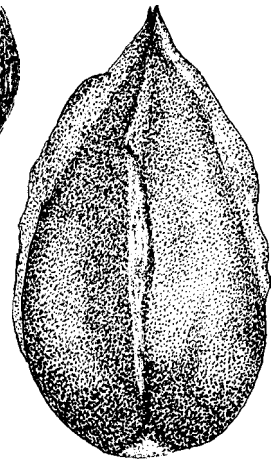
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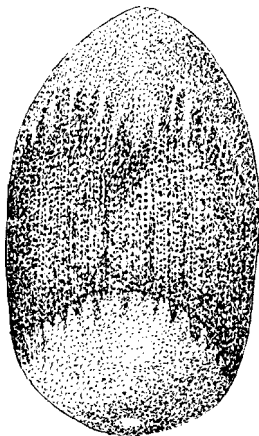
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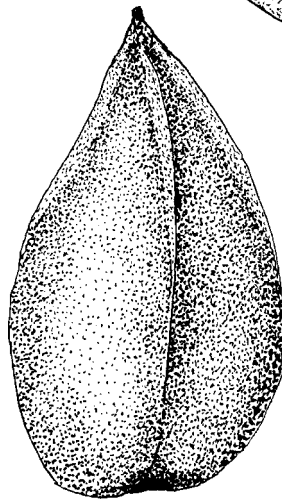
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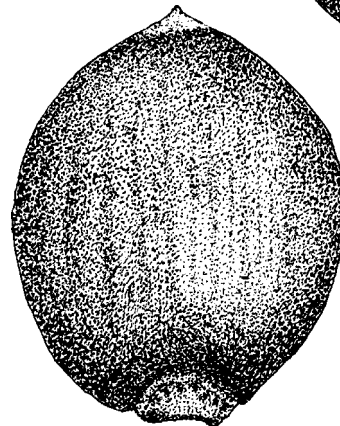
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135

decorative species, planted in forests and parks in many varieties, in the whole Carpathians.

**141. *Castanea sativa* Mill., *C. vesca* Gaertn.** — Tree, up to 20-40 m high, corona strongly ramified. **Fruits nuts, broad ellipsoid, irregular rounded or ovoid, apex acuminate with the rest of stigma and bunch of yellowish hairs, base truncate, with large oval hilum, 20-35 x 30-45 mm. Surface smooth or faint longitudinal furrowed, slight lustrous, dark-brown. 2n = 24.** Native to the Mediterranean and western Asia; planted in orchards, forests, gardens for edible, delicious nuts. Hu, Mo, Pl, Ro, Sk, Uk.

**142. *Quercus cerris* L., *Q. austriaca* Willd.** — Tree, up to 30 m high, rarely shrub, trunk often crooked, twigs more or less tomentose. **Fruits acorns, prolonged ellipsoid or cylindrical, situated in a shallow cupule covered with mostly bended scales, apex with a small beak, base with a round hilum, 25-40 x 15-20 mm. Surface smooth or faint longitudinal furrowed, slight lustrous, pale-brown. 2n = 24.** Native to southeastern Europe, in light, diluted forest, in submontane zones, 650-900 m elevation; planted in woods for timber. Cz, Hu, Mo, Ro, Sk, Uk.

**143. *Quercus coccinea* Münchh.** — Tree, up to 20-25 m high, corona irregular, spreading. **Fruits acorns, ellipsoid to ovoid, apex rounded with a small beak encircled by a whitish ring, base truncate with a round hilum, 20-30 x 15-20 mm. Surface smooth, weakly shine, cinnamon-brown.** Native to eastern North America; often planted in parks for its attractively colored leaves in autumn. Uk.

**144. *Quercus dalechampii* Ten., *Q. aurea* Wierzb., *Q. calcarea* Troitz.** — Tree, up to 20-30 m high, corona huge, twigs glabrous. **Fruits acorns, prolonged ovoid to ellipsoid, apex rounded with a small beak, base truncate with a rounded hilum, 30-36 x 14-18 mm. Surface smooth, dull, pale-brown. 2n = 24.** Native to the eastern Mediterranean region, in dry, light deciduous forests, in lowlands, tolerant of dryness and frosts; planted for timber. Hu, Mo, Ro, Sk, Uk.

**145. *Quercus ilex* L. *Q. gracidis* Lange** — Shrub or tree, up to 25 m high, twigs and buds tomentose. **Fruits acorns, prolonged ovoid, as much as one half closed in a cupule, apex with small beak, base truncate with a convex hilum hemmed with a black ring, 18-26 x 10-16 mm. Surface distinct furrowed**

**in the upper part, bottom smooth, glabrous, brown.** Native to southern Europe, squeamish, therefore seldom planted in parks, in warmer areas only, sometimes naturalized. Hu, Ro, Uk.

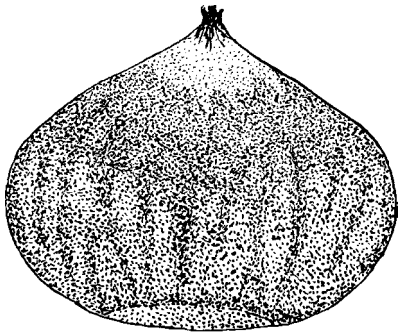
**146. *Quercus macranthera* Fisch. et Mey. ex Hohen.** — Tree, up to 10-20 m high, leaves 6-18 cm long, nearly leathery, obovoid. **Fruits acorns, oval, apex with a small beak, bottom truncate, 27-33 x 13-17 mm. Surface shallow furrowed, smooth, brown.** Native to the woods behind the Caucasus; in the Carpathians rarely cultivated in parks, gardens and windbreakers as a decorative plant. Mo, Uk.

**147. *Quercus palustris* Münchh.** — Tree, up to 25 m high, quickly growing when young, bark grey-brown, cracked, twigs somewhat pendent. **Fruits acorns, broad oval, nearly globose, compressed, apex with small beak, base with globular, slight convex hilum, 10-14 x 12-18 mm. Surface smooth or longitudinal furrowed, glabrous, brown, as much as one third settled in cupule. 2n = 24.** Native to North America; planted in parks, experimentally in forests for timber. Br, Hu, Mo, Sk, Uk.

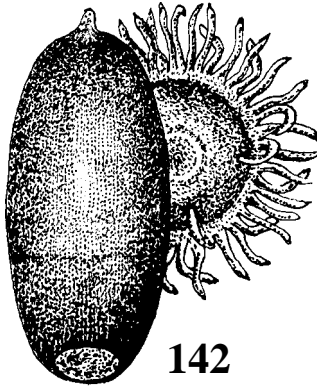
**148. *Quercus pedunculiflora* C. Koch** — Shrub or tree, up to 20 m high, trunk bark cracked, young twigs brownish-green with elliptic lenticels. **Fruits acorns, prolonged oval, with small beak on top, base narrowed, with rounded hilum, 27-35 x 12-15 mm. Surface smooth, with some indistinct ribs, glabrous, pale-brown.** Native to the eastern Mediterranean, growing on sunny calcareous slopes, stony steppes; planted in forests and rarely in parks. Mo, Ro.

**149. *Quercus petraea* (Matt.) Liebl., *Q. sessilis* Ehrh., *Q. sessiliflora* Salisb.** — Tree, up to 40 m high, corona pyramidal, twigs glabrous. **Fruits acorns, cylindrical to ellipsoid, in a shallow cupule, apex and base round, 15-21 x 12-16 mm. Surface smooth, glabrous, brown. 2n = 24.** Native to Europe, dominant in deciduous woods on poorer grounds, in submontane zones; often planted in forests and parks throughout the Carpathians.

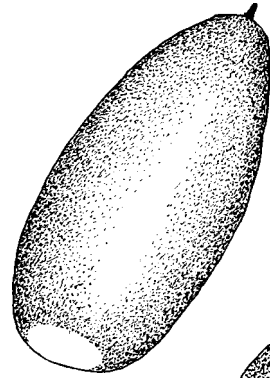
**150. *Quercus pubescens* Willd., *Q. humilis* Mill.** — Shrub or tree, up to 25 m high, trunk often crooked, twigs downy. **Fruits acorns, ellipsoid, rounded at both ends, base with a small, globose hilum, 22-28 x 11-14 mm. Surface smooth, indistinct ribbed, slight lustrous, brown. 2n = 24.** Native to central and southern Europe, on light sunny slopes, rocky steppes,



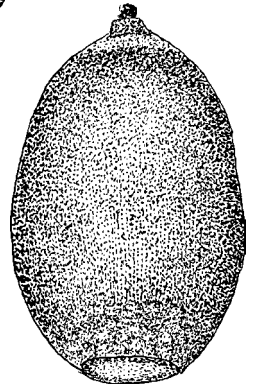
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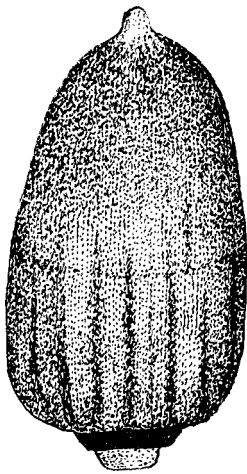
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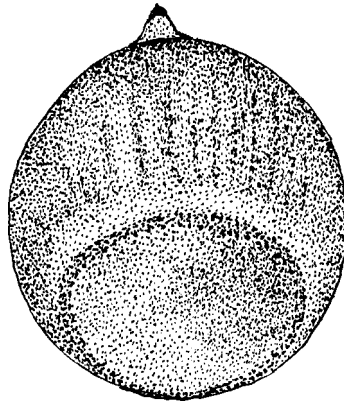
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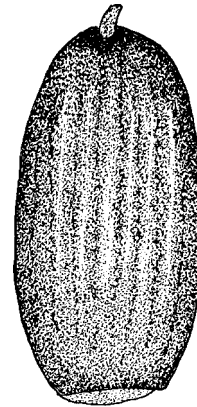
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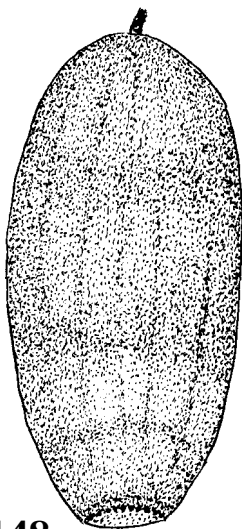
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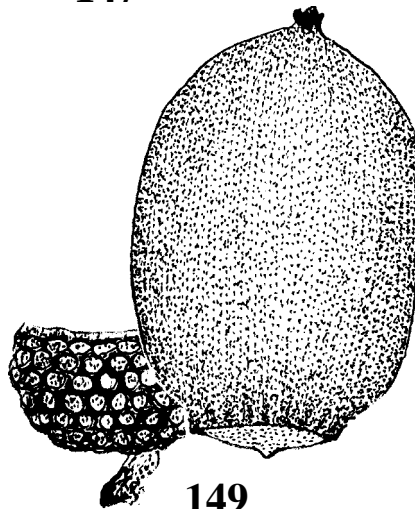
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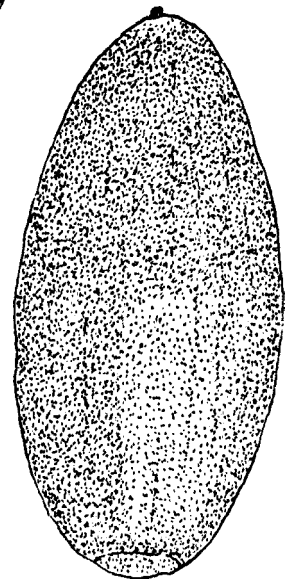
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in warmer areas, up to 1300 m elevation, on calcareous stands. Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**151. *Quercus robur* L., *Q. pedunculata* Ehrh.** – Tree, up to 45 m high, trunk glabrous, young twigs pubescent. **Fruits acorns, ellipsoid, apex with a small beak, base and hilum globose, 20-33 x 11-18 mm. Surface smooth, weak shiny, with some faint longitudinal ribs, buff-brown. 2n = 24.** Native nearly to whole Europe, eastern Asia and northern Africa; commonly planted in forests, parks, gardens, in many varieties, in the submontane zone; throughout the Carpathians.

**152. *Quercus rubra* L., *Q. borealis* Michx.** – Tree, up to 25-30 m high, corona spreading, huge, twigs glabrous, dark red. **Fruits acorns, ovoid to cylindrical, seated only in cupule with a base, apex with a small beak, 22-28 x 16-20 mm. Surface smooth, slight lustrous, glabrous, cinnamon-brown. 2n = 24.** Originally growing in North America; in the Carpathians often planted in parks, gardens as decorative tree, experimentally in forests for timber. Br, Cz, Hu, Pl, Sk, Uk.

**153. *Quercus suber* L.** – Tree, up to 10-20 m high, evergreen, bark of the trunk and twigs with coarse layer of the cork. **Fruits acorns, ellipsoid, the apex with a small beak, bottom ± truncate, 23-30 x 13-17 mm. Surface shallow furrowed, smooth, brown.** Native to the Mediterranean; in the Carpathians cultivated mostly in botanical gardens as an attractive tree, rarely in parks, in the warmest zones.

#### 18. PLATANACEAE

**154. *Platanus hispanica* Münchh., *P. hybrida* Brot., *P. acerifolia* (Aiton) Willd.** – In appearance very similar to *P. occidentalis*. **Fruits prolonged obovoid or globose head of the achenes, apex with the rest of stigma, narrowed up to the base, with numerous stiff bristles, 9-11 x 2-3 mm. Surface wrinkly, short-hairy, dull, pale- or rusty-brown. 2n = 42.** Probably of hybrid origin, often planted in parks, road-rows and town-green as a solitary, or in small groups, widely naturalized. Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**155. *Platanus occidentalis* L.** – Tree, huge, up to 50 m high, wide-spreading corona, outright branches and a yellow-white bark peeled into small scales. **Fruits achenes with the globular head, with a plume of rusty bristles from the base, on the apex with a permanent crooked stigma, 10-12 x**

**1.5-2 mm.** Originally growing in North America; often cultivated in parks and road-rows as ornamental. Hu, Pl, Ro, Sk, Uk.

**156. *Platanus orientalis* L.** – Tree, up to 30 m high with a wide-spreading corona, bark brownish-grey, peeled into large scales. **Fruits similar to those of *P. occidentalis*, 10-12 x 1.5-1.8 mm, the colours of fruits and bristles rusty-brown. 2n = 42.** Native to southeastern Europe and southwestern Asia, warmth-requiring tree; often planted in parks, gardens and road-rows as ornamental. Hu, Mo, Ro, Sk, Uk.

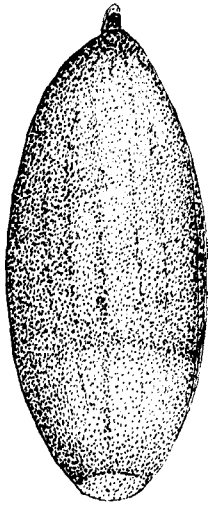
#### 19. SALICACEAE

**157. *Populus alba* L., *Leuce alba* (L.) Opiz** – Tree, up to 30 m high, with a dense broad corona, beneath side of the leaves felty. **Seeds club-shaped with a plume of whitish down at the base, 1.8-2 x 1-1.3 mm. Surface ± longitudinal furrowed, dull, glabrous, whitish-brown. 2n = 38 (57).** Native to southern and central Europe, in wet forests of lowland and upland zones; often planted for timber elsewhere in the Carpathians.

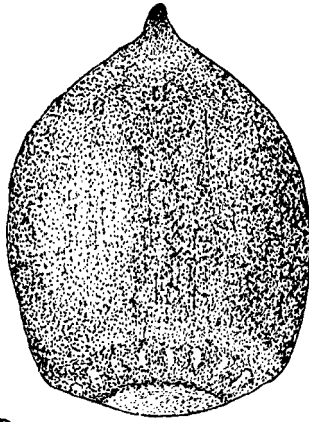
**158. *Populus deltoides* Marsh.** – Tree, up to 30 m high, corona broad, branches erect to patent, greyish. **Seeds lanceolate, narrowed on both sides, apex pointed, with a plume of dirty-white down at the base, 2.5-3 x 1-1.3 mm. Surface longitudinal furrowed, glabrous, whitish-grey or brown. 2n = 38.** Originally growing in North America, on river-banks; often planted in forests for timber, in parks and along roadsides, naturalized in several places. Br, Cz, Hu, Mo, Sk, Uk.

**159. *Populus grandidentata* Michx.** – Tree, up to 20 m high, with a rather narrow corona, young twigs grey-tomentose. **Seeds ± cylindrical or club-shaped, apex rounded, bottom ± truncate, 1.8-2.1 x 0.9-1.1 mm. Surface shallow or deep furrowed, dull, whitish-brown.** Native to eastern North America; in the Carpathians rarely planted experimentally in forests.

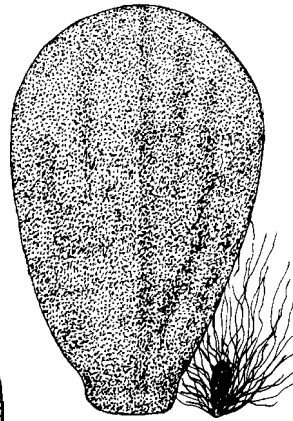
**160. *Populus nigra* L., *P. pyramidata* Moench** – Tree, up to 30 m high, corona irregular, with furrowed bark, young twigs yellowish. **Seeds cylindrical, apex rounded, base truncate with a concave hilum, a plume of whitish-yellow down on the base, 2-2.8 x 0.9-1.2 mm. Surface longitudinal furrowed, dull, glabrous, whitish light-brown. 2n = 38.** Native to southern and central Europe and western Asia, usually beside river or lakes, very variable species; often



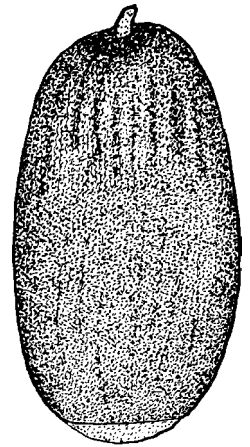
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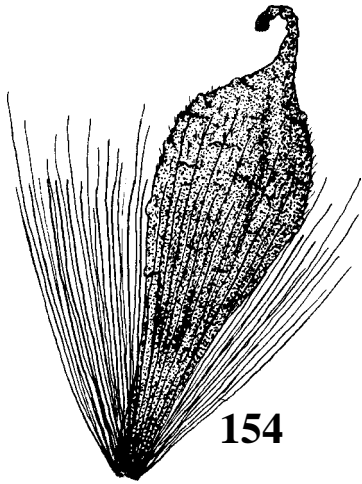
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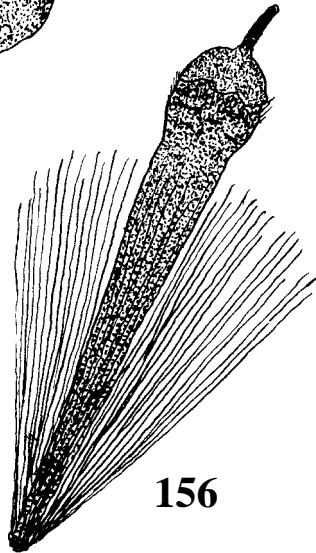
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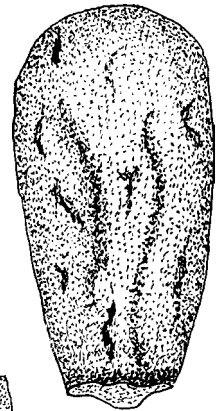
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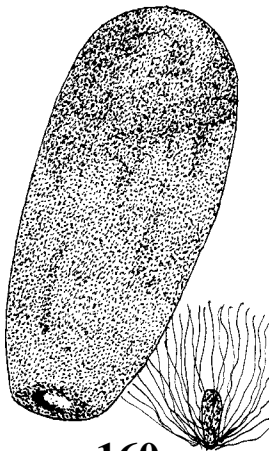
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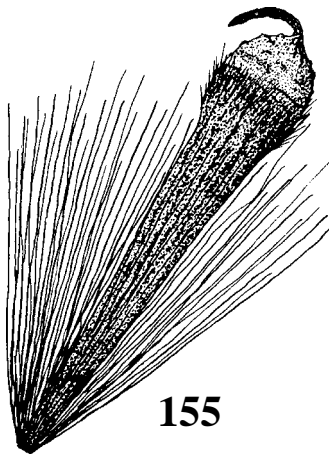
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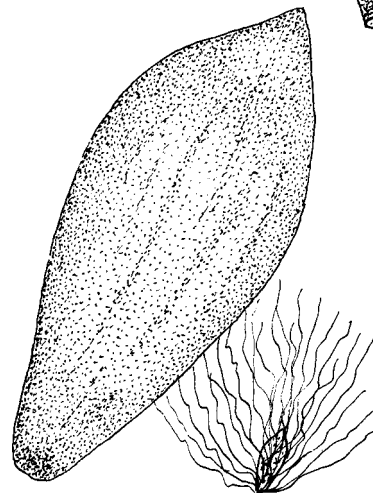
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planted in forests, roadsides, mostly in lowlands, sometimes naturalized, throughout the Carpathians.

**161. *Populus tremula* L., *Tremula vulgaris* Opiz** – Tree, up to 20 m high, bark greyish, young twigs hairy. **Seeds in outline clavate or slight spatulate, slight rounded, base truncate with conical hilum, furnished with long silky down, 1.7-2 x 0.9-1.1 mm. Surface foveolate, lustreless, slight furrowed, whitish-grey. 2n = 38.** Native to Eurasia, common in woods and thickets; often cultivated elsewhere from lowlands up to montane zones, throughout the Carpathians.

**162. *Populus x canadensis* (Aiton) Sm., *P. euroamericana* (Dode) Guinier** – Tree, slender, with pyramidal corona, twigs roundish or oval, leaves deltoid, acuminate, crenate. **Seeds cylindrical, lateral slight compressed, 2.3-2.5 x 1-1.2 mm. Surface yellowish-white, dense covered with long white down.** Species of hybrid origin (*P. deltoides* x *nigra*); in the Carpathians often cultivated along roads (only male).

**163. *Salix acutifolia* Willd., *S. daphnoides* var. *acutifolia* Döll** – Shrub, up to 8 m high, twigs and leaves bare. **Seeds ellipsoid, cottony, apex with small cup, narrowed at below part, 1.3-1.7 x 0.5-0.6 mm. Surface longitudinal interrupt furrowed, lustreless, greyish-brown. 2n = 38.** Native to the north-eastern Europe, on sandy riverbanks, open sandyish areas, often planted for strengthen the sand-beds and sand-hills, likewise near the houses. Br, Cz, Mo, Pl, Ro, Sk, Uk.

**164. *Salix alba* L.** – Tree, up to 25 m high, with flexible twigs and an irregular corona. **Seeds cylindrical, apex truncate, base slight narrowed with a plume of whitish down at the base, 1.1-1.5 x 0.4-0.5 mm. Surface longitudinal furrowed, smooth, dull, whitish-grey, farinose. 2n = 76.** Native to Eurasia, on shrubby riverbanks, wet lowland forests; plentiful in the whole Carpathians, on sandy, loamy, stony grounds, planted along dwelling places.

**165. *Salix alpina* Scop., *S. jacquiniana* Willd.** – Shrub, more or less procumbent, knotted, crooked, young twigs downy. **Seeds cylindrical, embedded in white down, apex rounded, bottom narrowed with a slight convex hilum, 1.4-1.7 x 0.4-0.6 mm. Surface slight furrowed, dull, whitish-brown to brown. 2n = 38.** Native in the Alps and Carpathians, in airy dwarf pines, alpine ridges, grassy and stony

slopes, on moist, calcareous and dolomitic grounds. Pl, Ro, Sk, Uk.

**166. *Salix aurita* L., *S. inserata* J. et C. Presl, *Caprea aurita* (L.) Opiz** – Shrub, up to 1-3 m high, rich spreadingly ramified, twigs slender, angular, in young state hirsute. **Seeds cylindrical, embedded in white down, apex rounded, base narrowed, truncate with a concave hilum, 1-1.2 x 0.3-0.4 mm. Surface furrowed, dull, glabrous, dark-brown, slight farinose. 2n = 38, 76.** Native to Europe except the Arctic and the Mediterranean regions, common in fens and forests bogs, moist heaths, throughout the Carpathian territory.

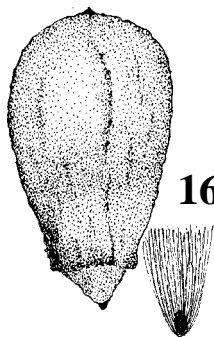
**167. *Salix babylonica* L.** – Tree, up to 20 m high, corona spreading with long pendent twigs. **Seeds cylindrical, apex with small blunt point, base throttled with plume of whitish down, 1.3-1.6 x 0.4-0.5 mm. Surface furrowed, dull, brown. 2n = 76.** Native to southeastern Asia, probably China; planted as a "Sadder willow" in humid sites, parks, gardens, town verdure, especially in warmer areas, more or less naturalized. Cz, Hu, Pl, Ro, Sk, Uk.

**168. *Salix bicolor* Ehrh. ex Willd., *S. phylicifolia* L., *S. weigeliana* Willd.** – Shrub, up to 2-4 m high, shoots glabrous, slight pubescent, brownish-rusty. **Seeds cylindrical, embedded in white down, apex rounded, base slight narrowed, truncate with a concave hilum, 1.2-1.4 x 0.35-0.45 mm. Surface slight furrowed, dull, brown. 2n = 114.** Native to mountains of Europe, swamp meadows, springheads, rarely in subalpine and alpine zones, on wet stands, non-calcareous soils. Br, Cz, Pl, Uk.

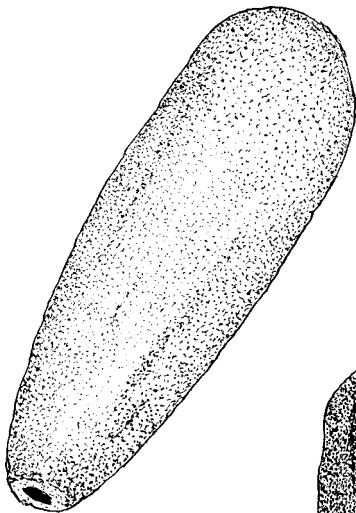
**169. *Salix caprea* L., *Caprea vulgaris* Opiz** – Shrub or tree, up to 10 m high, with smooth, slender twigs and obovoid corona. **Seeds cylindrical, embedded in white down, apex rounded, bottom 1/3 narrowed, 1.4-1.7 x 0.4-0.5 mm. Surface deeply furrowed, wrinkly, slight lustrous, brown. 2n = 38, 57, 76.** Native to Eurasia, common in light woods and hedges, often from lowland up to the subalpine zone; very decorative and favorite willow throughout the Carpathians.

**170. *Salix cinerea* L., *Caprea cinerea* (L.) Opiz** – Shrub, up to 6 m high, twigs stout, pubescent, brown or greyish. **Seeds cylindrical, apex rounded with a small beak, base truncate with a concave hilum, furnished with a flocculus of white down at the base, 1.3-1.5 x 0.3-0.4 mm. Surface shallow**

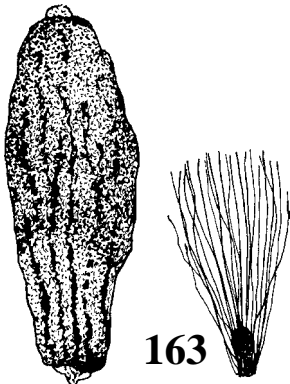




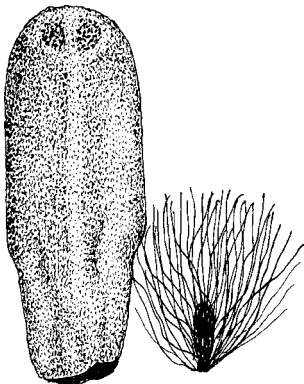
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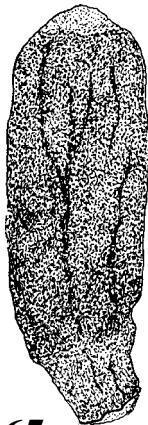
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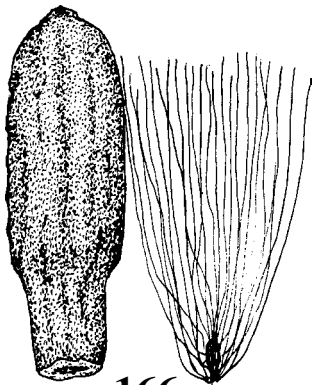
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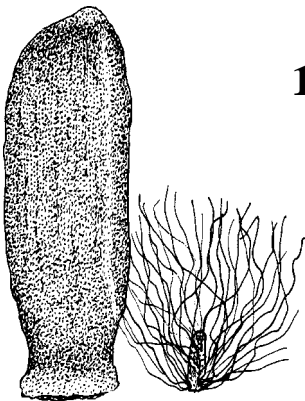
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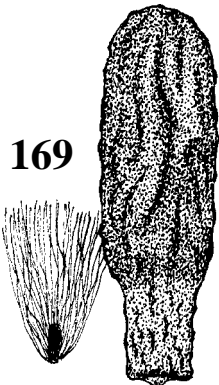
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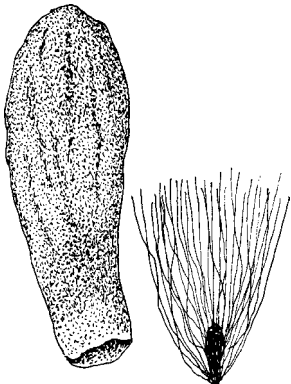
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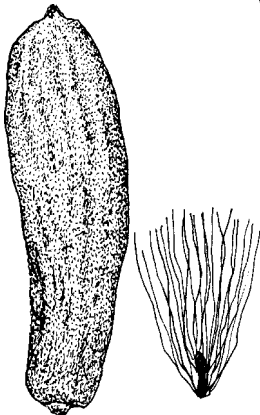
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furrowed, dull, glabrous, dark-brown.  $2n = 76$ . Native to Eurasia, in swamps, along river streams, airy forests, from lowland up to the submontane zone of the Carpathians.

**171. *Salix daphnoides*** Vill., *S. bigommis* Hoffm. — Shrub or tree, up to 10 m high, with a robust corona, twigs bluish hoary. **Seeds cylindrical to prolonged obovoid, apex round with a small beak, base slight throttled with concave hilum, furnished with a flocculus of white down at the base,  $1.5-2 \times 0.5-0.6$  mm. Surface glabrous or shallow striate, dull, dark-grey.  $2n = 38, 44, 57, 88$ .** Native to northern and central Europe; in the Carpathians planted around domiciles and cemeteries as a very decorative tree with nice catkins. Br, Cz, Hu, Pl, Ro, Sk, Uk.

**172. *Salix elaeagnos*** Scop., *S. incana* Schrank — Shrub, rarely tree, up to 15 m high, twigs slender, downy when young. **Seeds cylindrical, embedded in white down, apex rounded, base throttled,  $1.4-1.7 \times 0.5-0.6$  mm. Surface glabrous or shallow furrowed, whitish-grey or brownish.  $2n = 38$ .** Native to central Europe, on shrubby river and brookbanks, water-logged grounds, damp, sandy or gravelly soils. Cz, Hu, Ro, Sk, Uk.

**173. *Salix fragilis*** L. — Shrub or tree, up to 25 m high, often pollarded with a rough, thick bark and globose corona. **Seeds cylindrical, embedded in white down, gentle-compressed, apex conical or rounded, often with a white cuplet, base truncate with a concave hilum,  $1.4-1.7 \times 0.5-0.6$  mm. Surface shallow furrowed, dull, whitish-brown or grey to nigrescent.  $2n = 76$ .** Native to Eurasia, in coastal shrubberies, wet lowland forests, overflowing grounds, up to 1300 m elevation; planted in many hybrids, throughout the Carpathians.

**174. *Salix glauca*** L. — Shrub, up to 1 m high, young twigs downy, brown or yellowish later on lustrous. **Seeds cylindrical, apex rounded with small beak, bottom 1/3 narrowed, base with a convex hilum, furnished with a flocculus of white down at the base,  $1.7-2 \times 0.5-0.7$  mm. Surface smooth or longitudinal furrowed, green or greenish-brown.  $2n = 114, 152, 190$ .** Native to mountains of Eurasia and America, circumpolar species; rarely planted in rock-gardens.

**175. *Salix hastata*** L., *S. alpina* Schleich. — Shrub, up to 1.5-2 m high, with ascending or erect, lustrous twigs. **Seeds cylindrical or ellipsoid, apex rounded,**

**base throttled, truncate with a convex hilum, furnished with a flocculus of white down at the base,  $0.7-0.9 \times 0.2-0.3$  mm. Surface shallow irregular-furrowed, dull, brown.  $2n = 38$  (c.100).** Native to Eurasia, on mountain meadows and pastures, on stony, humous, alkaline grounds of moist slopes, near brooks and moist wastes. Cz, Hu, Pl, Ro, Sk, Uk.

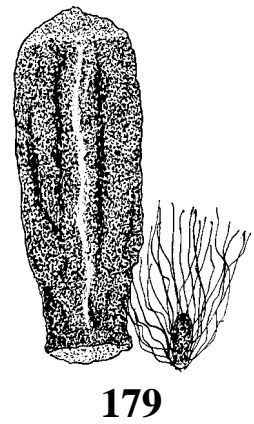
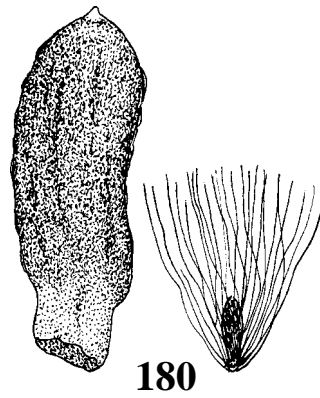
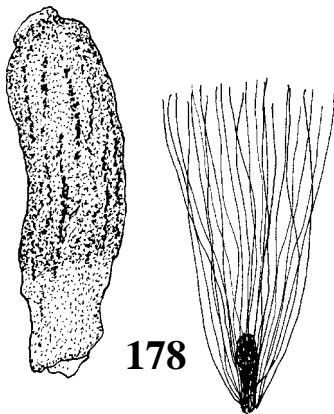
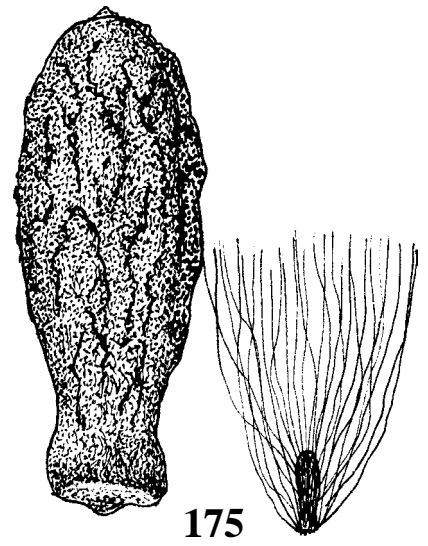
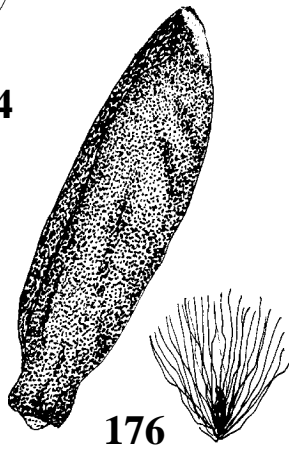
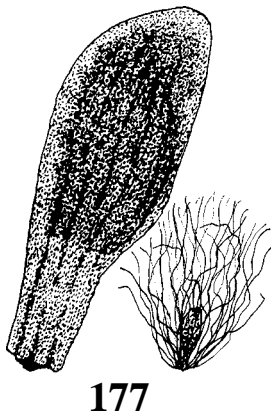
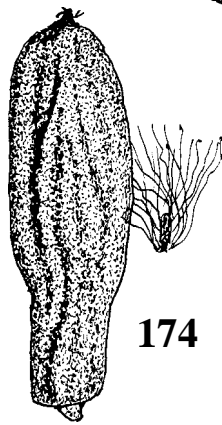
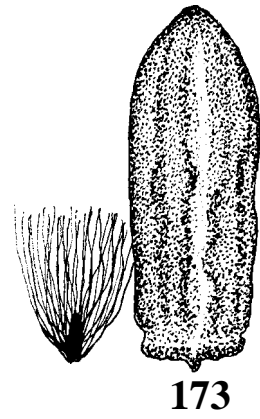
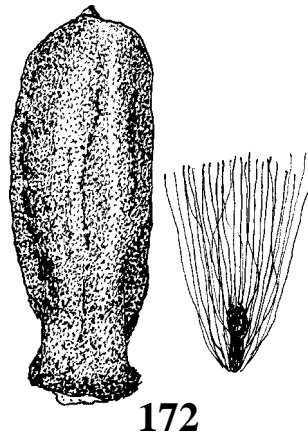
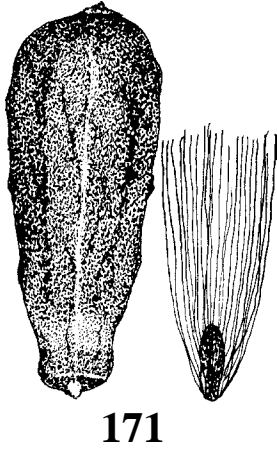
**176. *Salix herbacea*** L., *S. pumila* Salisb. — Shrub, up to 5 cm high, with underground stems and few aerial twigs. **Seeds cylindrical, embedded in white down, apex conical, base narrowed, truncate, with a small convex hilum,  $1.6-2 \times 0.3-0.4$  mm. Surface glabrous, with some furrows, reddish-brown.  $2n = 38$ .** Native to subarctic and arctic mountains of Eurasia and America, common on rocky wastes; as curiosity planted in rock-gardens. Cz, Hu, Pl, Ro, Sk, Uk.

**177. *Salix kitaibeliana*** Willd. — Shrub, up to 50 cm high, twigs creeping, bare. **Seeds cylindrical, apex slanting, rounded, base narrowed at the bottom third, furnished with a flocculus of white down at the base,  $1.7-2 \times 0.6-0.7$  mm. Surface furrowed, brown.  $2n = 76$ .** Native to the High Tatra mountains, on non-calcareous rocks and steady wastes; attractive species for rock-gardens. Pl, Ro, Sk, Uk.

**178. *Salix lapponum*** L., *S. daphneola* Tausch — Shrub, up to 1.5 m high, with smooth or humpy, on the ground creeping twigs. **Seeds cylindrical, sometimes crooked, apex rounded, base narrowed with small convex hilum, furnished with a flocculus of white down at the base,  $1.3-1.5 \times 0.3-0.4$  mm.  $2n = 38, 76$ .** Boreal Eurasian species, on mountain meadows, peatbogs, riverbanks, lawny rocky slopes, wet rocks. Br, Pl, Sk, Uk.

**179. *Salix matsudana*** Koidz. — Shrub or tree, up to 10 m high, with conspicuously crooked twigs. **Seeds cylindrical, apex rooflike and pale, bottom part narrower, truncate, with a plume of white down at the base,  $1.3-1.4 \times 0.5-0.6$  mm. Surface shallow furrowed, glabrous, dull, whitish-grey.  $2n = 76$ .** Originally growing in eastern Asia, recently in form *tortuosa* Rehd. with turning twigs; often planted in parks, garden and town verdure. Ro, Sk.

**180. *Salix myrtilloides*** L. — Shrub, with subterranean creeping stems, twigs up to 50 cm long, upright, with short evanescent hairs. **Seeds cylindrical, apex rooflike with a white beak, base narrowed, white**



down longer than seeds, 1.2-1.5 x 0.35-0.45 mm. Surface shallow furrowed, glabrous, dull, brown.  $2n = 38$ . Native to Eurasia, extending on swamps and peatbogs; in the Carpathian mountains very scarce. Br, Pl, Ro, Sk, Uk.

**181. *Salix pentandra* L.** — Shrub or tree, up to 5-10 m high, with reddish-brown, shining, glabrous, non-fragile twigs. **Seeds cylindrical, apex acuminate, bottom part narrowed, base truncate, with a plume of white down at the base, 1.6-2 x 0.3-0.4 mm. Surface smooth or shallow furrowed, bottom part hyaline tuberculate, dull, pale-brown.  $2n = 76$ .** Native to Eurasia, except the extreme north and south, in mountain valleys, marshes, fens and wet woods, light-requiring species; planted elsewhere throughout the Carpathians.

**182. *Salix purpurea* L., *S. monandra* auct.** non Host — Shrub, up to 5 m high, with slender, glabrous, flexible twigs when young. **Seeds cylindrical, slight flattish, embedded in white down, apex mostly truncate with small white beak, bottom third narrowed and throttled, 1.1-1.3 x 0.4-0.5 mm. Surface fine longitudinal striate, whitish-grey.  $2n = 38$ .** Native to Eurasia, in coastal shrubberies, damp meadows and peatbogs, wet lowland forests, up to 800 m elevation; planted for basketry and as the slope-reinforcing plant, throughout the Carpathians.

**183. *Salix repens* L., *S. arenaria* L.** — Shrub, up to 1 m long, branches  $\pm$  procumbent, creeping or ascending. **Seeds cylindrical, apex rounded, mostly pale, 1/4 or 1/3 of the bottom part narrowed, base with a short concave hilum, with a plume of white down at the base, 1.4-1.6 x 0.6-0.7 mm. Surface smooth or shallow longitudinal furrowed, dull, greyish-brown.  $2n = 38$ .** Native to subarctic, arctic and high mountains of Europe, mostly on calcite, rarely on granite foundations, bogs and swamps. Cz, Sk, Uk.

**184. *Salix reticulata* L.** — Shrub, low, creeping, 5-20 cm long, twigs  $\pm$  herbal, leaves rounded or oval, with saw-margin. **Seeds clavate, with a cup at the apex, bottom part narrowed, with a plume of white down at the base, 1.3-1.4 x 0.3-0.4 mm. Surface smooth, lustreless, yellowish or pale-brown, apex and bottom dark-brown.  $2n = 38$ .** Native to the highest mountains of Europe (Alps, Carpathians), on grassy, stony ridges, rocks, snow-lyings, in alpine zones. Pl, Ro, Sk, Uk.

**185. *Salix retusa* L.** — Shrub, low, dwarfed, creeping, twigs up to 30 cm long, glabrous, leaves 12-25 mm, oblong up to broadly obovoid, lustrous on both sides. **Seeds cylindrical, embedded in white down, apex roundish with a low beak, bottom part (c. 1/3) narrowed, 1.8-2 x 0.6-0.7 mm. Surface slight wrinkly, faint lustrous, pale- or greyish-brown.  $2n = 114$ .** Native to mountains of the Alps and Carpathians, on calcite rocks and screes, rarely on granit, in the alpine zones. Pl, Ro, Sk, Uk.

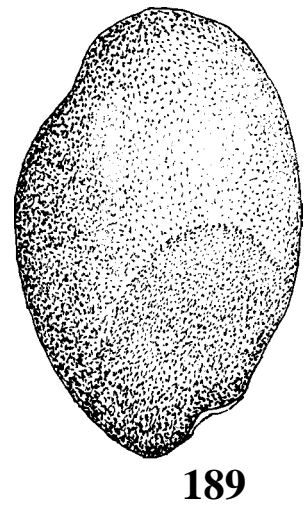
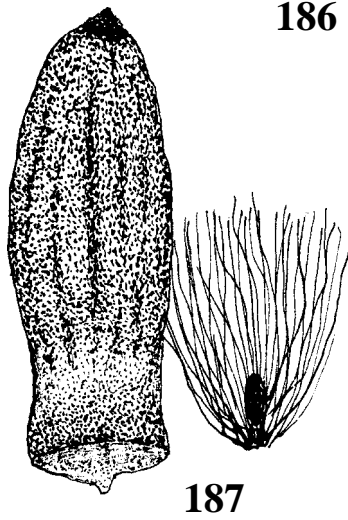
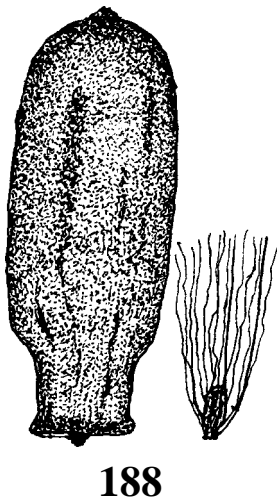
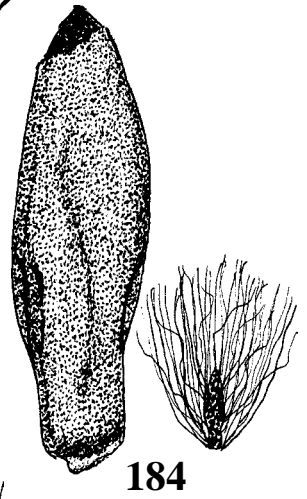
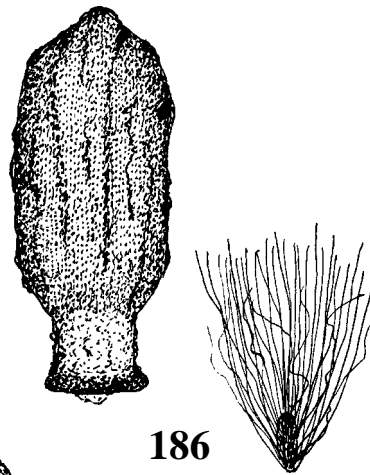
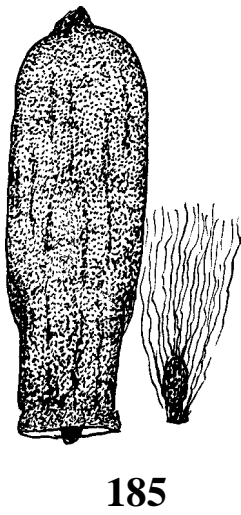
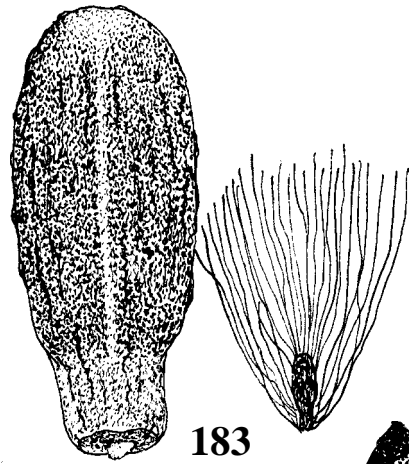
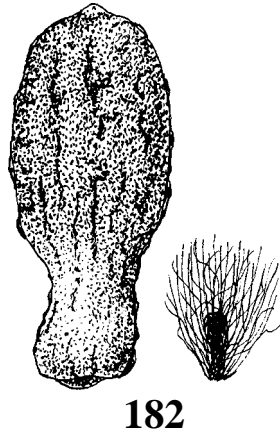
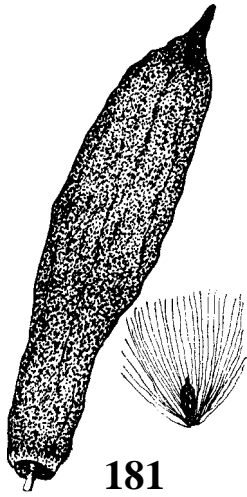
**186. *Salix rosmarinifolia* L., *S. repens* subsp. *rosmarinifolia* (L.) C. Hartm.** — Shrub, up to 1 m high, twigs slender, sparsely covered with short hairs, erect. **Seeds cylindrical, embedded in white down, apex with a short beak, bottom narrowed, with concave hilum, 1.4-1.8 x 0.5-0.7 mm. Surface glabrous, lustreless, dark-brown, necklet usually whitish or white.  $2n = 38$ .** Native to montane zones of central Europe and Siberia, on bogs and swamps, sandy, gravelly and stony wet stands. Cz, Br, Hu, Pl, Ro, Sk, Uk.

**187. *Salix triandra* L., *S. amygdalina* L.** — Shrub or small tree, up to 10 m high with glabrous, brown twigs. **Seeds oblong to slight clavate, apex acuminate, distinct darker than pericarp, bottom part throttled, base with a small hilum, with a plume of white down at the base, 1-1.2 x 0.3-0.4 mm. Surface glabrous, dull, pale-brown.  $2n = 38$  (44, 88).** Native to Eurasia, on damp, overflowed riverbanks and shrubberies, wet lowland forests; sometimes planted for basketry and slopes reinforcement, throughout the Carpathians.

**188. *Salix viminalis* L., *S. longifolia* Lam.** — Shrub or small tree, up to 5-10 m high with long, switch, flexible twigs. **Seeds cylindrical, embedded in white down, apex rounded, 1/4 of bottom part narrowed, base concave with a short hilum, 1.2-1.4 x 0.4-0.5 mm. Surface slight furrowed longitudinal, glabrous, dull, green.  $2n = 38$ .** Native to Eurasia, in coastal shrubberies along brooks and rivers; often planted for basketry, widely naturalized, throughout the Carpathians.

## 20. MORACEAE

**189. *Morus alba* L., *M. indica* auct. non L., *M. tatarica* L.** — Tree, up to 15 m high, corona spreading round, twigs slender, smooth. **Seeds irregular obovoid or orbicular, flattish, lateral suture drab, 2-2.5 x 1.4-1.7 mm. Surface smooth, dull, yellowish.  $2n = 28$ .** Native to the Orient (China),



planted since ancient times as food for silkworms and as a roadside tree; throughout the Carpathians, widely cultivated for its fruit.

**190. *Morus nigra* L., *M. tirnaviensis* Domin** – Tree, up to 10 m high, with roughish twigs and a spreading corona. **Seeds prolonged obovoid or ellipsoid, trigonous, flattish, dorsal side rooflike, neutral narrow, with conspicuous growth at base, 2.5-3 x 1.6-2 mm. Surface smooth, dull, terracotta. 2n = 308 (89-106).** Originally growing in southwestern Asia, warmth and light-requiring tree, since ancient times planted on vineyard slopes, gardens and alleys for its large, palatable multiple fruits. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**191. *Morus rubra* L.** – Tree, up to 20 m high, with dense, wide globular corona and bare twigs. **Seeds obovoid, trigonous, flattish, dorsal side rooflike, ventral narrow with excrescence at base, 1.6-2 x 1.1-1.3 mm. Surface smooth, dull, greyish-brown. 2n = 28.** Native to North America; rarely planted in parks as ornamental, and in gardens for edible, multiple fruits. Sk.

**192. *Maclura pomifera* (Raf.) C. K. Schneid., *M. aurantiaca* Nutt.** – Shrub or tree, up to 2-10 m high, with spiny twigs and scaly ridges bark. **Seeds irregular-ovoid or reniform, apex narrowed, with a small beak, base aslant truncate, 6-7.5 x 3.5-4.5 mm. Surface faint longitudinal furrowed, with lateral suture on ventral side, dull, yellowish-brown.** Originally growing in North America; planted as a hedge plant, and for ornament in the warmest areas, locally naturalized. Cz, Hu, Mo, Ro, Sk, Uk.

**193. *Broussonetia papyrifera* (L.) L'.** Hér., *Morus papyrifera* L. – Shrub or tree, up to 15 m high with spreading hirsute twigs and a broad corona, young twigs villous. **Seeds obovoid or obtrigonus, dorsal side convex with a rib in the middle, ventral side flat and narrow, border with two ribs, apex truncate, base narrowed up to acuminate, 1.7-2 x 1.4-1.6 mm. Surface wrinkly, lustrous, pale- to reddish-brown. 2n = 26.** Native to China, Japan, where its bark is used in paper industry; in the Carpathians planted in parks as ornamental. Cz, Hu, Mo, Ro, Sk, Uk.

**194. *Ficus benjamina* L.** – Shrub or tree, up to 10 m high, with slender drooping branches. **Seeds broad clubform, apex with the rest of stigma, base prolonged into a narrowed leg, 1.6-2 x**

**0.8-1 mm. Surface fine tuberculate, shiny, whitish, with chocolate spots in the upper part.** Native to tropical Asia; grown as a potted plant, or outdoors in warm parts of the Carpathians.

**195. *Ficus carica* L.** – Shrub or small tree, up to 10 m high, deciduous, with a low, wide rounded corona. **Seeds obovoid, apex faint rounded, base pointed, lateral suture indistinct, 1.6-2 x 1.2-1.4 mm. Surface smooth, dull, light-terracotta. 2n = 26.** Native to the Mediterranean and southwestern Asia, planted commercially in warmer localities for edible fruits and as an ornamental in areas of moderate climate. Hu, Mo, Ro, Sk, Uk.

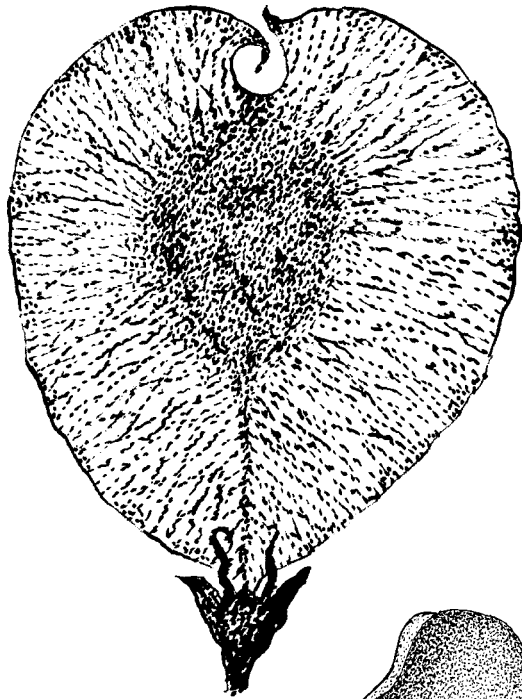
## 21. ULMACEAE

**196. *Ulmus glabra* Huds., *U. scabra* Mill., *U. montana* Stokes.** – Tree, up to 40 m high with smooth bark, young branches hispid. **Fruits samaras, shape obovate or broad cordate, flattish, seed-loculus usually central, 10-15 x 10-14 mm. Surface of nut-loculus orange-brown, wings thin, transparent, margin glabrous, nerves upward-directed. 2n = 28.** Native to northern and central Europe, western Asia, relatively wide spread in forests up to 1300 m elevation; planted in many varieties in parks and hedges, throughout the Carpathians.

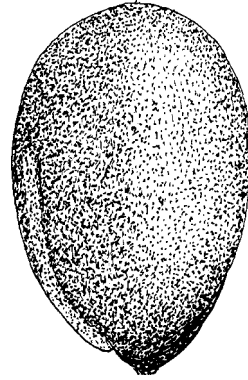
**197. *Ulmus laevis* Pall., *U. effusa* Willd.** – Tree, up to 30 m high, with a wide corona, bark greyish-brown, young twigs hispid. **Fruits samaras, elliptic, flattish, base and apex more tapering, seed-loculus central or almost so, 12-14 x 8.5-10.5 mm. Surface glabrous, nerved, orange-yellow, wings margin hirsute, pale. 2n = 28.** Native to Eurasia, as part of deciduous and mixed forest, especially abundantly on riverbanks and flooded areas; often cultivated in parks and along roads throughout the Carpathians.

**198. *Ulmus minor* Mill., *U. campestris* auct. non L., *U. carpinifolia* Gled.** – Shrub or tree, up to 30 m high with glabrous twigs. **Fruits samaras, cordate, obovate or elliptic, flattish, seed-loculus usually concentrated about 2/3 from the base, 18-22 x 12-15 mm. Surface glabrous, rare pubescent, ± nerved, orange-brown, wings translucent, margin glabrous, light-brown. 2n = 28.** Native to Europe, in lowland forests, shrubby slopes, river valleys, in wet lowland and upland stands. Cz, Pl, Mo, Ro, Sk, Uk.

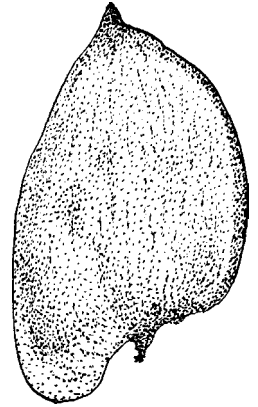
**199. *Ulmus pumila* L., *U. pinnato-ramosa* Dieck ex Koehne** – Shrub or tree, up to 20 m high, with a rough bark. **Fruits samaras, globose, flattish, seed-loculus**



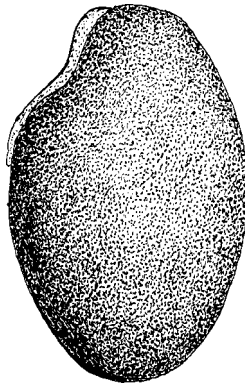
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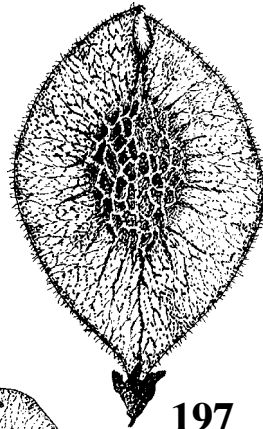
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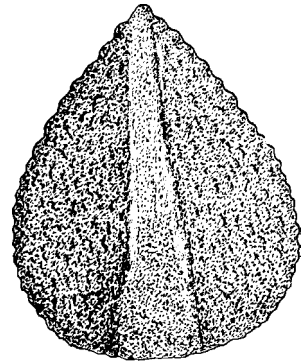
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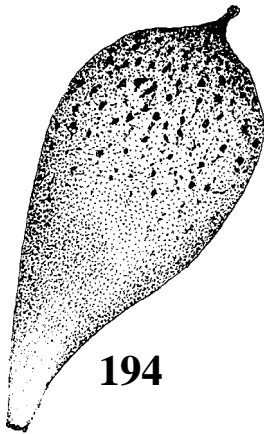
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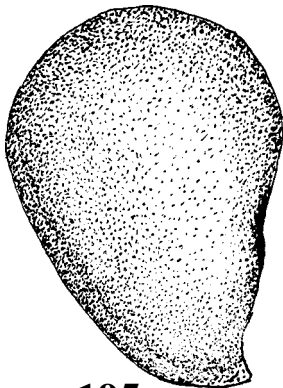
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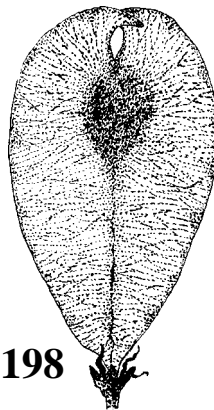
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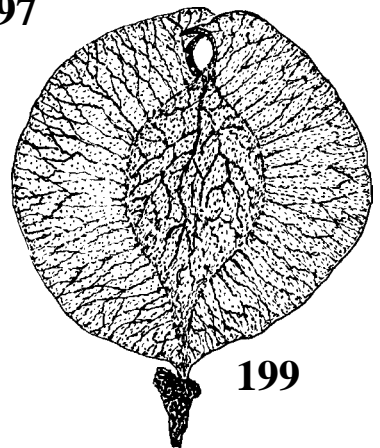
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in central position, 12-14 x 10-12 mm. Surface with expressive venation, dull, glabrous, whitish-yellow, wings translucent, margin glabrous. Native to northern Asia; seldom planted in forests, parks, gardens. Br, Mo, Ro, Uk.

**200. *Celtis australis* L.** — Tree, up to 10-20 m high, twigs and leaves beneath tomentose. **Stones globose with two longitudinal ribs, 4.4-5.2 x 4.3-4.7 mm. Surface reticulate-rugose, dull, glabrous, white or creamy. 2n = 20, 28.** Native to southern Europe and the Asia Minor; seldom planted in parks and along streets. Cz, Hu, Ro, Sk, Uk.

**201. *Celtis occidentalis* L.** — Tree, up to 15-25 m high, with a warty, grey to brown bark, corona narrow, round-topped. **Stones globose with 4 ridges, base narrowed with the hilum, 5.5-6.5 x 4.6-5.2 mm. Surface reticulate-rugose, dull, glabrous, pale-sandy, isabelline to light-greyish. 2n = 40.** Originally growing in North America; often cultivated in parks, along roads and streets, in warmer areas, naturalized in lowland forests. Cz, Hu, Mo, Ro, Sk, Uk.

**202. *Zelkova serrata* (Thunb.) Mak., *Z. acuminata* Planch.** — Tree, up to 30 m high, with a short trunk, strongly ramified into a spreading corona. **Stones trigonous, dorsal side convex with a distinct rib in the middle, ventral side flat to concave, apex narrowed and acuminate, base truncate, 3.9-4.3 x 2.8-3.2 mm. Surface reticulate, wrinkly, dull, glabrous, green.** Originally growing in Japan; in the Carpathians rarely planted in parks as ornamental.

## 22. URTICACEAE

**203. *Urtica cannabina* L.** — Perennial plant with stalk up to 70-200 cm high, upright, square, hairy. **Fruits achenes, ovoid, flattish, lateral view biconvex, apex tapered, base round, 2.4-2.6 x 1.6-1.8 mm. Surface wrinkly or slight verrucose, margin distinct brighter, greenish-brown.** Native to central Asia; invading into the Carpathians as weed growing on rubbish, roadsides, near domiciles, sometimes planted for fibre. Br, Pl, Uk.

**204. *Urtica dioica* L., *U. major* Kanitz** — Perennial, usually dioecious plant, up to 60-150 cm high, upright, stalk square. **Fruits achenes, ellipsoid, flattish, with a marginal rib, lateral view biconvex, apex and base tapering, 1-1.2 x 0.7-0.9 mm. Surface fine tuberculate, slight lustrous, glabrous, light-brown. 2n = 48, 52.** Native to Eurasia, now cosmopolitan,

growing in lowland forest, felled areas, on rubbish, road borders, brookbanks, fences, shrubberies, medicinal plant; throughout the Carpathians.

**205. *Urtica dubia* Forskål, *U. membranacea* Poir.** — Annual, 15-80 cm high, monoecious, racemes unisexual. **Fruits achenes, broad ovoid, apex acuminate, bottom broad with a small hilum, 1-1.2 x 0.6-0.7 mm. Surface faint tuberculate, slight lustrous, whitish-yellow.** Native to the Mediterranean region; seldom hauling into the Carpathians.

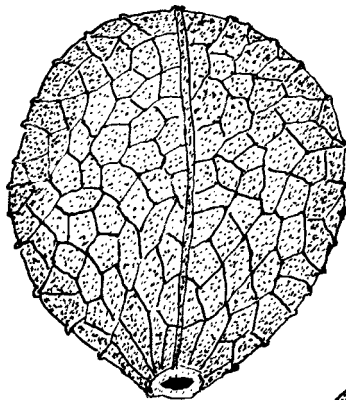
**206. *Urtica galeopsifolia* Wierzb. ex. Opiz.** — Perennial, stems 30-150 cm high, densely covered with simple and burning hairs. **Fruits achenes, ovoid, apex with a beak, 1-1.1 x 0.6-0.7 mm. Surface faint tuberculate, slight lustrous, yellowish.** Native to southern as well as eastern Europe, in light woods, shrubberies, on moist places. Uk.

**207. *Urtica kioviensis* Rogow., *U. radicans* Bolla** — Perennial, monoecious plant, up to 200 cm high, upright, glabrous. **Fruits achenes, ovoid, flattish, lateral view biconvex, apex tapering with persistent brush-like style, margin with a very narrow wing, 1-1.2 x 0.6-0.8 mm. Surface faint tuberculate, slight shiny, glabrous, light-brown. 2n = 22.** Native to central and eastern Europe, as weed in woodlands, shrubberies, swamps and other very damp places, ones cultivated for fibre. Br, Cz, Hu, Mo, Ro, Sk, Uk.

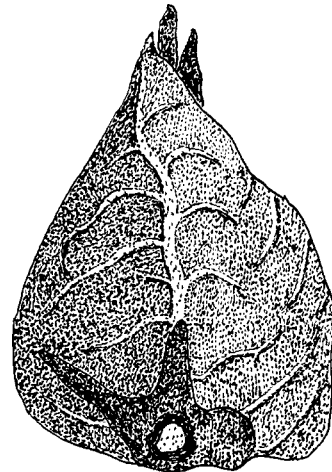
**208. *Urtica pilulifera* L.** — Perennial, up to 30-80 cm high, with large, broad leaves. **Fruits achenes, wide ovoid, lateral view biconvex, apex tapering, 2.2-3.2 x 1.8-2.6 mm. Surface fine tuberculate, glossy, glabrous, dark-brown to nigrescent. 2n = 24, 26.** Native to North America, naturalized in the Mediterranean and hauling into central Europe, on rubbish and other places with high contents of nitrogen. Cz, Ro, Sk, Uk.

**209. *Urtica urens* L., *U. minor* Lam., *U. ovalifolia* Stokes** — Perennial, up to 60 cm high, branching from the base, with acutely incised-dentate leaves. **Fruits achenes, elliptic, flattish, lateral view biconvex, apex and base tapering, apex with a brush-like style, 0.9-1.1 x 0.7-0.8 mm. Surface fine foveolate, glabrous, dull, light-greyish or pale-brown. 2n = 24, 26 (52).** Native to Euro-Siberian and Mediterranean territories, now cosmopolitan, weed in gardens, on rubbish, fences, near dwelling; in lowlands of the Carpathians.

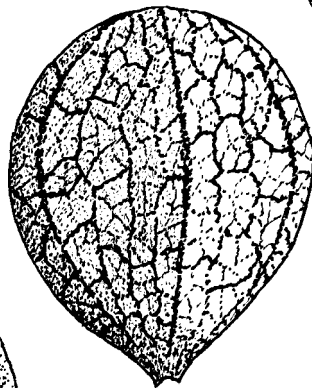




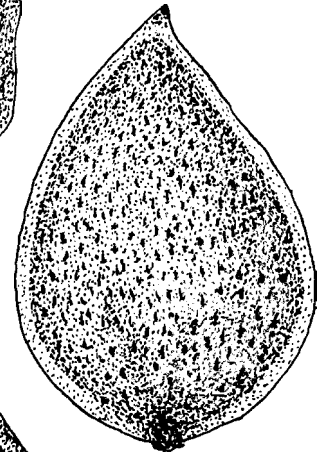
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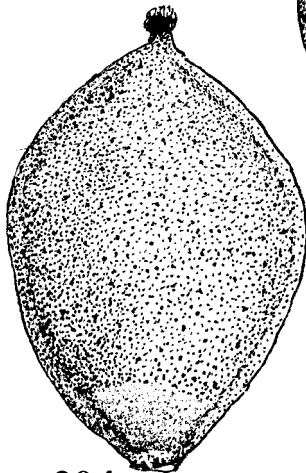
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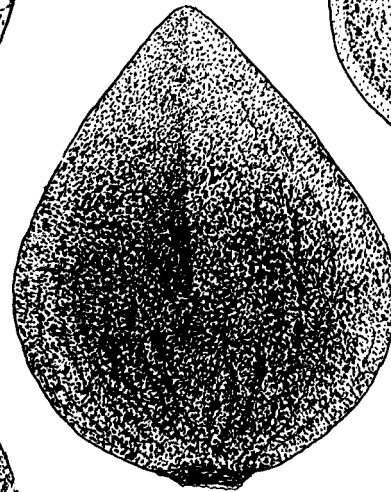
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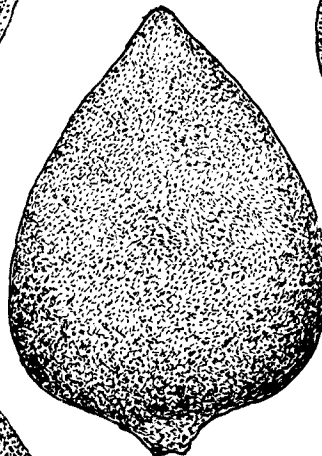
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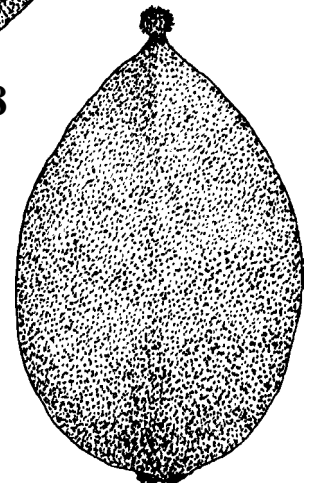
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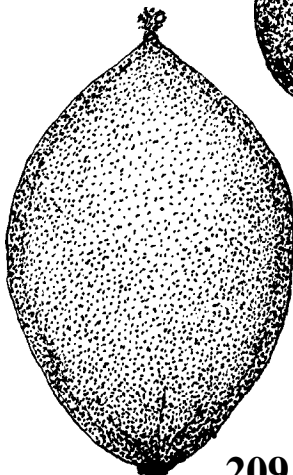
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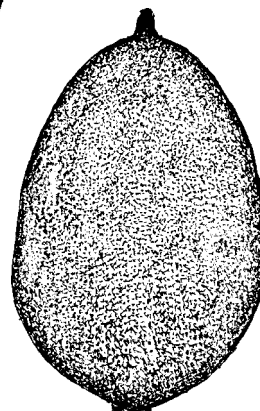
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**210. *Parietaria judaica* L., *P. difflusa* Mert. et W. D. J. Koch, *P. ramiflora* Moench** – Perennial, up to 40 cm high, stems at base crawling, ascendent branched. **Fruits achenes, ovoid, slight flattish, lateral view biconvex, hilum white, 1.2-1.4 x 0.8-0.9 mm. Surface smooth, glossy, glabrous, black with one small greenish spot. 2n = 26.** Native to the Mediterranean; hauling into the Carpathians, on waste places, walls, rocks, screes. Cz, Hu, Ro, Sk, Uk.

**211. *Parietaria lusitanica* L., *P. serbica* Pančić** – Annual, up to 5-25 cm high, stems slender, filiform, procumbent, simple or branched. **Fruits achenes, ovoid, flattish, lateral view biconvex, apex tapering, base truncate, 1.1-1.3 x 0.6-0.7 mm. Surface smooth, glabrous, glossy, brown or olive.** Native to southeastern Europe, in shady places, stony grounds, rocky slits, on steppes and walls. Hu, Ro, Uk.

**212. *Parietaria officinalis* L., *P. erecta* Mert. et W. D. J. Koch** – Perennial, up to 30-100 cm high, stalk upright, simple or slightly branched, densely pubescent. **Fruits achenes, ovoid, lateral view biconvex, apex tapering, suture marked, hilum circular at base, 1.1-1.5 x 0.7-0.9 mm. Surface smooth, glossy, glabrous, black, shiny. 2n = 14, 48.** Native to southern Europe; naturalized throughout the Carpathians, from lowlands up to submontane zones, on ruderalized areas, in communities, on damp shady rocks and banks. Cz, Hu, Pl, Mo, Ro, Sk, Uk.

**213. *Parietaria pensylvanica* Mühlenb.** – Annual, stems erect, 20-80 cm high, inflorescence scarce. **Fruits achenes, ovoid, lateral compressed, apex acuminate, 1-1.2 x 0.7-0.8 mm. Surface glabrous, glossy, pale- or dark-brown. 2n = 16.** Native to North America, rarely hauling into Carpathians and other parts of Europe.

**214. *Boehmeria nivea* (L.) Gaud.** – Semishrub, strong tufted, stems up to 2 m high. **Fruits achenes, globular, slight flattish, apex with a long rest of the style, base narrowed, 0.8-1 x 0.5-0.7 mm. Surface faint tuberculate, dull, with scattered white bristles, greenish-brown to brown.** Native to China and India, cultivated in southern Europe for fibre and for ornament, rare locally naturalized. Hu.

## 23. CANNABACEAE

**215. *Humulus lupulus* L.** – Perennial, herbaceous twining plant, up to 6 m long, with 3-5 lobed leaves, dioecious. **Fruits achenes, ovate or elliptic, lateral view biconvex, margin slight listed, apex with a**

**style-rest, 2.2-2.6 x 1.8-2.4 mm. Surface glabrous, smooth, ± lustrous, grey-brown to dark-brown, marginal list and base pale-brown. 2n = 20.** A plant, cultivated since ancient times, with obscure origin, probably Europe. The infructescence of a female plant is used in brewing beer, often an escape from hopfields; in the whole Carpathians.

**216. *Humulus scandens* (Lour.) Merr., *H. japonicus* Siebold et Zucc.** – Annual, trailer plant with long creeping stalks. **Fruits achenes, globose, apex and base strong tapering, 3-4 x 2.8-3.6 mm. Surface smooth, dull, greyish-brown. 2n = male 16, female 17.** Originally growing in eastern Asia, now and then cultivated in gardens and parks as a covering plant for chatter-houses and walls, occasionally escape. Cz, Hu, Ro, Sk.

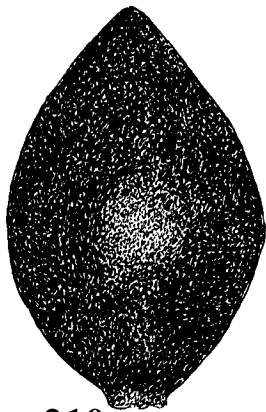
**217. *Cannabis ruderalis* Janisch., *C. sativa* L. subsp. *spontanea* (Czern.) Serebr.** – Annual, stalk up to 50-100 cm, weakly trenched. **Fruits achenes, obovoid or oval, slight flatt, lateral sutures expressive, 3-4 x 2.2-3 mm. Surface smooth, shiny, grey with dark drawing. 2n = 20.** Native of Asia, hauled into Europe, and uniquely naturalized on waste places. Mo, Ro, Sk, Uk.

**218. *Cannabis sativa* L., *C. chinensis* Delile** – Annual, stems 80-250 cm high, upright, branched, dioecious. **Fruits achenes, ellipsoid, lateral view biconvex, margin with an edged list, hilum at base circular, 4.5-5.5 x 2.5-3.5 mm. Surface smooth, glabrous, barely lustrous, nerved, nerves anastomosing, olive to olive-brown or light grey-green. 2n = 20.** Native of Asia Minor; widely cultivated for fibres, oil and narcotic resin; naturalized in a large part of the Carpathians.

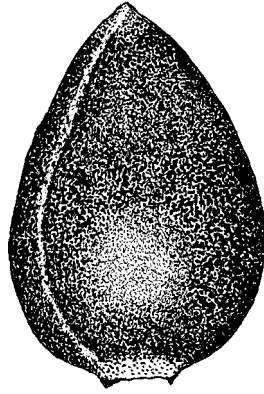
## 24. PHYTOLACCACEAE

**219. *Phytolacca americana* L., *P. decandra* L.** – Perennial, up to 3 m, stem and twigs reddish, herbaceous to woody, strongly ramified. **Seeds depressed spherical or reniform, 3-3.6 x 2.6-3 mm. Surface smooth, glossy, glabrous, purplish to black. 2n = 36.** Native to North America, on waste places; planted as ornamental and for dye from the berries and leaves, also as vegetable (high vitamin C contents), medical plant, widely naturalized. Hu, Mo, Ro, Sk, Uk.

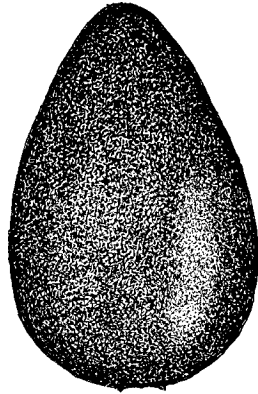
**220. *Phytolacca esculenta* Houtte, *P. acinosa* Roxb.** – Perennial, up to 1.5-2.5 m high, branched from base, herbaceous. **Seeds spherical, compressed,**



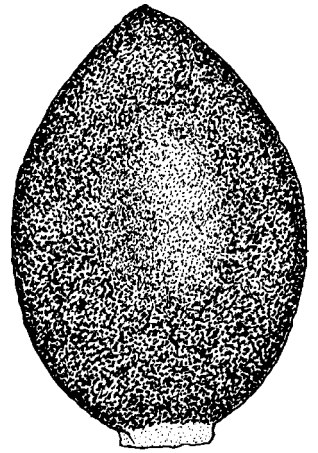
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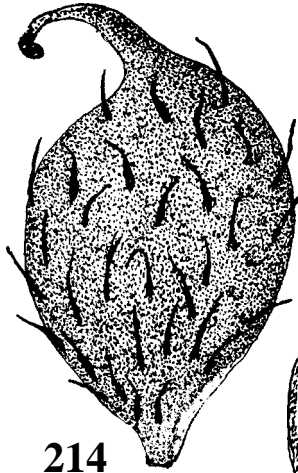
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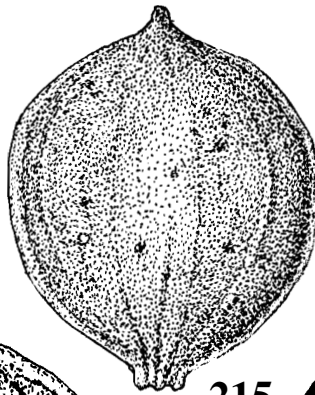
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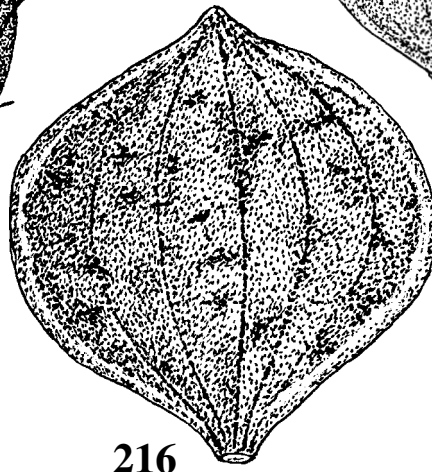
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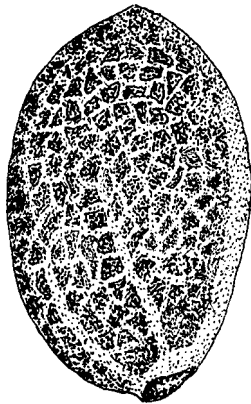
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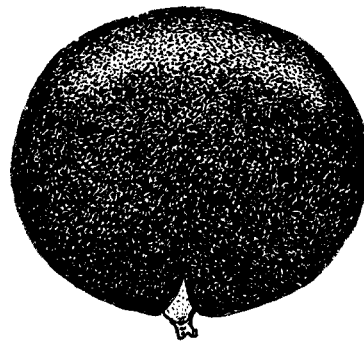
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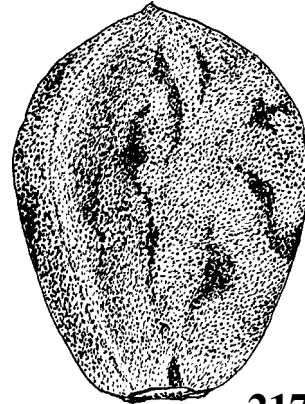
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220



217

**2.5-2.8 x 3-3.2 mm. Surface smooth, glossy, glabrous, black.  $2n = 36$ .** Native to Asia; cultivated as ornamental, vegetable and as a medical plant, uniquely naturalized. Ro, Sk.

## 25. MOLLUGINACEAE

**221. *Mollugo cerviana* (L.) Ser., *Pharnaceum cerviana* L.** — Annual, up to 40 cm high, greenish-grey, glabrous, erect or procumbens, branched. **Seeds obovoid to reniform, flattened laterally, apex slight rounded, base narrowed, strophioles absent, 0.35-0.45 x c. 0.3 mm. Surface smooth or reticulate to ribbed, shiny.** Native to Eurasia, southern Africa, on ruderal, sandy, wandering or permanent dunes, gravelly places, uniquely naturalized in southern Europe; rarely escapes into the Carpathians. Mo, Ro, Uk.

## 26. AIZOACEAE

**222. *Cryophytum crystallinum* (L.) N. E. Br., *Mesembryanthemum crystallinum* L.** — Annual, creeping, all covered with glittering papillae. **Seeds subglobular, apex slight rounded, base truncate, 0.8-1 x 0.9-1 mm. Surface rough with minute tubercles, dull or slight lustrous, greyish-brown.  $2n = 18$ .** Originally in the Mediterranean, on maritime sands and salt-marshes; in the Carpathians rarely cultivated as an ornamental, sporadically as vegetable, uniquely transiently naturalized.

## 27. TETRAGONIACEAE

**223. *Tetragonia tetragonoides* (Pall.) O. Kuntze, *T. expansa* Murr.** — Annual, procumbent stalk up to 1 m long, with pulped leaves. **Fruits nutlike, obovoid, angled, horns [2-4-6-7], apex truncate with 4-5 prickly growth, base narrowed, 9-13 x 9-12 mm. Surface roughish, dull, greyish-black.  $2n = 32$ .** Originally introduced from Australia; once commonly cultivated as vegetable and naturalized in southern Europe; sporadically hauling into the Carpathians.

## 28. NYCTAGINACEAE

**224. *Mirabilis dichotoma* L., *M. odorata* L.** — Perennial, up to 1 m high, glandular-downy, ramified. **Fruits elliptic to globose, apex tapered with a low-beak, base with a broad and rough hilum, 6.5-7.5 x 4.5-5 mm. Surface with 5 longitudinal sutures, transversal humpy, fine hairy, dull dark-brown to nigrescent.  $2n = 54, 58$ .** Originally growing in North America, often planted in gardens as ornamental, transiently naturalized, probably a variety of *M. jalapa*.

**225. *Mirabilis jalapa* L.** — Annual or perennial, with stems up to 100 cm high, erect, flowers shortly stalked. **Fruits elliptic to globose follicles, apex tapered up to the beak, base tapered up to a large concave hilum, 7.3-7.7 x 4.4-5 mm. Surface with five sutures, transversal humpy, fine hairy or hairless, dull, dark-brown to black.  $2n = 54, 58$ .** Native to North America; throughout the Carpathians planted as ornamental in gardens, rarely naturalized.

**226. *Mirabilis longifolia* L.** — Perennial, up to 60-100 cm high, erect, rich ramified, leaves glandular-pubescent. **Fruits elliptic follicles, apex tapered, base with a broad hilum, 9-11 x 6-7 mm. Surface short hairy with large unhairied spots, dull, dark-brown, hairs light-brown.  $2n = 54, 58$ .** Place of origin Mexico; often planted in gardens as ornamental, occasionally escape and naturalized.

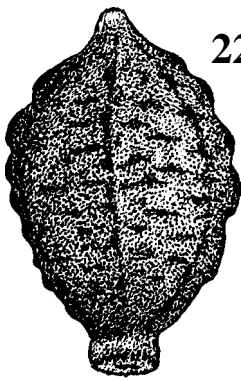
**227. *Oxybaphus nyctagineus* (Michx.) Sweet, *Mirabilis nyctaginea* (Michx.) MacMill.** — Perennial, up to 1 m high, erect, glabrous, dichotomously branched. **Fruits prolonged obovoid to club-shaped follicles, with 5 longitudinal ribs, 4.7-5.2 x 2.1-2.5 mm. Surface verrucose, dull, hairy, brown or greyish-brown.  $2n = 58$ .** Originally growing in North America, along railways, on grasslands, as a weed and ruderal; rarely planted in gardens as an ornamental plant. Br, Cz, Hu, Mo, Ro, Sk, Uk.

## 29. OPUNTIACEAE

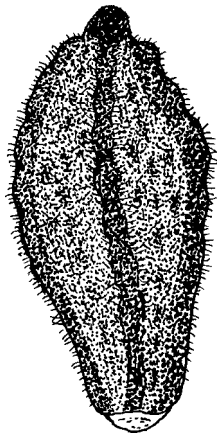
**228. *Opuntia ficus-indica* Mill.** — Shrub or tree, rich ramified, up to 4 m high, single articles elliptical or prolonged-elliptical, c. 45 x 15 cm. **Seeds  $\pm$  spherical, lateral compressed, at margin encircle with a strong hem, 3.7-4.3 x 3.7-4.3 mm. Surface fine waved, faint lustrous, greyish-yellow.** Native to Mexico; powerful articles and fruits are consumed as vegetable; in Carpathians rarely cultivated as ornamental, mostly in warmer territories. Ro, Uk.

**229. *Opuntia imbricata* DC.** — Shrub, up to 10 m high, twigs verticillate, horizontal, terminal articles cylindrical. **Seeds globular or obovate, lateral compressed, encircle at margin with a narrow hem, bottom narrowed into the hilum, 4.4-5 x 3.7-4.1 mm. Surface smooth.** Native to the southern part of North America; in the Carpathians rarely cultivated in gardens as ornamental, in warmer areas.

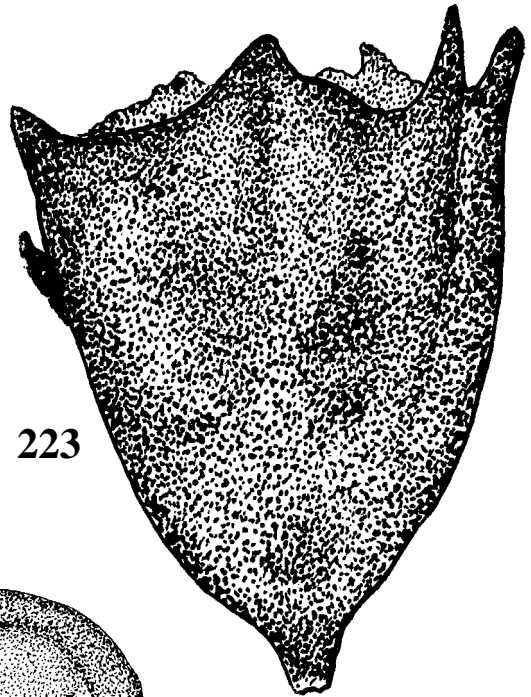
**230. *Opuntia vulgaris* Haw.** — Perennial, grovelling or upright, evergreen, divided stalk without leaves, pulped plant. **Seeds  $\pm$  globose, flattish, lateral view**



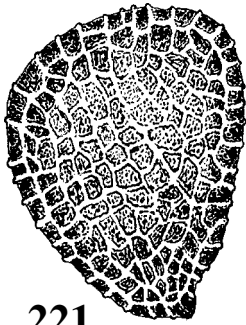
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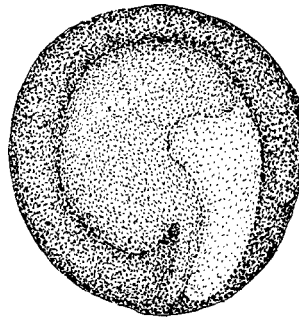
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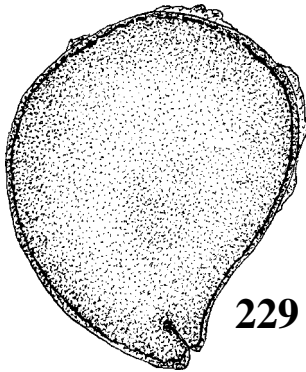
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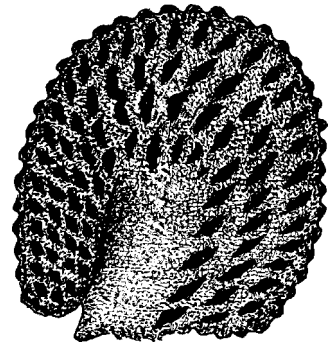
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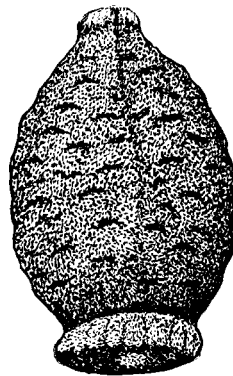
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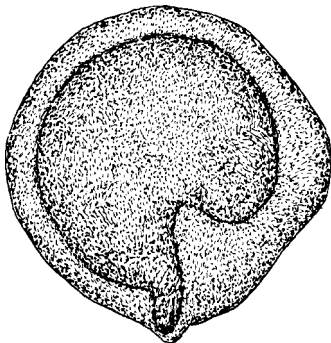
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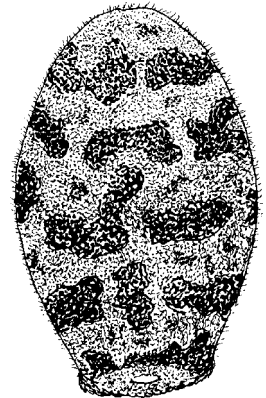
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226

slight biconvex, margin with a broad and strong hem, 4-5 x 4-4.6 mm. Surface smooth, lustreless, whitish-pink.  $2n = 22, 23$ . Native to North America; in the Carpathians cultivated as ornamental, in warmer areas and uniquely escapes. Hu, Ro, Uk.

### 30. PORTULACACEAE

**231. *Portulaca grandiflora*** Hook. — Annual, up to 20-40 cm high, upright, glabrous, fleshy. **Seeds reniform to globose, compressed, base with narrowish hilum, 0.6-0.8 x 0.5-0.7 mm. Surface verrucose, glossy, silver or greyish-black.  $2n = 10, 18, 36$ .** Native to South America; commonly cultivated as ornamental in gardens, cemeteries, balconies, in warmer areas, occasionally grown along roadsides and in waste places. Hu, Mo, Ro, Sk, Uk.

**232. *Portulaca oleracea*** L. — Annual, up to 50 cm high, procumbent or decumbent, with branched stems. **Seeds  $\pm$  triangular, lateral compressed, apex slight rounded, bottom tapering with a hilum, 0.8-1 x 0.7-0.9 mm. Surface verrucose, lustrous, nigrescent to black.  $2n = 54$ .** Native to Asia Minor and India, widespread weed on vegetable fields, vineyards and waste lands; also cultivated as a vegetable, mainly in southern Europe; rarely in the whole Carpathians.

**233. *Portulaca sativa*** Haw., *P. oleracea* subsp. *sativa* (Haw.) Schübl et G. Martens — Annual, up to 40-60 cm high, densely ramified, upright, pulpy. **Seeds reniform to globose, lateral compressed, bottom part tapering, 1.1-1.3 x 0.9-1.1 mm. Surface dense verrucose, shiny, black.  $2n = 54$ .** In southern Europe cultivated as a vegetable; in the Carpathians occasionally occurring as an escape.

**234. *Montia arvensis*** Wallr., *M. verna* Necker, *M. minor* C. C. Gmel. — Annual or perennial, up to 3-9 cm high, upright or extended on the earth, with weak branching, in water up to 50 cm long. **Seeds globular to reniform, flattish with a distinct hilum, 1.1-1.3 x 0.9-1.1 mm. Surface coarse verrucose, dull, black.  $2n = 20$ .** Native to northwestern Europe, secondary cosmopolitan; in the Carpathians growing in lowlands on moist and flooded sand fields, fallows and stripped pond bottoms. Br, Cz, Hu, Pl, Ro, Sk.

**235. *Montia fontana*** L. subsp. *fontana* — Annual or perennial, with weak branching stems up to 50 cm or more in water, but short and erect, more or less caespitose on land. **Seeds obovoid, lateral compressed, 1.2-1.8 x 1.2-1.4 mm. Surface fine reticulate, smooth, without papillae, lustrous,**

**nigrescent to black.  $2n = 18, 20$ .** Native to Euro-Siberia and North America, in water, on mud or seasonally damp open grounds. Cz, Hu, Pl, Ro, Sk.

**236. *Montia hallii*** (A. Gray) Greene, *M. fontana* subsp. *variabilis* Walters, *Claytonia hallii* A. Gray — Perennial, water-plant, up to 50 cm high, branched. **Seeds roundish or globose, slight compressed lateral, with a white later yellowish hilum, 0.9-1.2 mm in diam. Surface fine reticulate, granulate, faint lustrous with low blunt papillae, nigrescent to black.  $2n = 18, 20$ .** Arctic-antarctic species growing on sandy, stony, non-calcareous stands, mountain springheads; its extension in the Carpathians hitherto known unsatisfactorily.

**237. *Claytonia alsinoides*** Sims, *C. sibirica* auct. non L. — Annual or perennial, stems up to 15-30 cm high, erect. **Seeds ellipsoid or obovoid, lateral compressed, bottom narrowed with a hilum, 1.6-1.9 x 1.4-1.6 mm. Surface dense verrucose, glossy, dark-brown to black.** Native to North America, hauling in damp, shady places on acid sandy soils; into the Carpathians imported with agricultural produces, transiently naturalized.

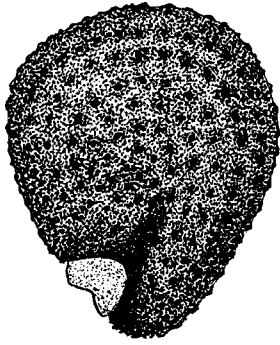
**238. *Claytonia perfoliata*** Donn ex Willd., *Montia perfoliata* (Donn) Howell — Annual, up to 10-20 cm, erect, bare plant. **Seeds elliptical, flattish, lateral view biconvex, 1.3-1.5 x 0.9-1.1 mm. Surface glabrous, faint tuberculate, glossy, black.  $2n = 36$ .** Originally growing in North and Central America, on almost dry sandy soils; in the Carpathians previously planted in gardens as vegetable, occasionally hauling, rarely naturalized.

### 31. BASELLACEAE

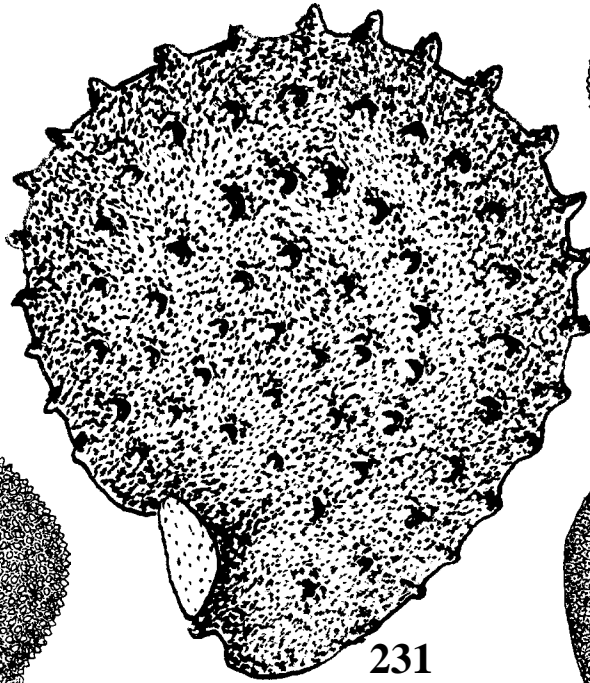
**239. *Basella alba*** L. — Perennial, up to 3 m high, stems slender, twinning, usually fleshy. **Fruits achenes, globular, apex with a broad beak, base narrowed with a concave hilum, 4.3-4.7 x 3.8-4.2 mm. Surface smooth, covered with a reticular layer, dull, black.  $2n = 48$ .** Probably native to tropical Asia; in southern Europe cultivated as vegetable, occasionally escapes, impermanent in the Carpathians.

### 32. CARYOPHYLLACEAE

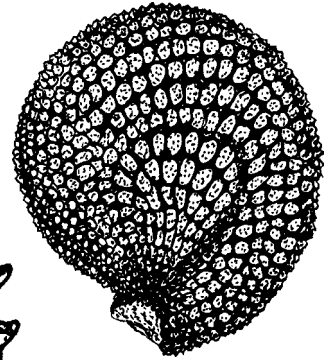
**240. *Corrigiola litoralis*** L. — Annual, up to 30 cm high, stems bare, greyish-green, decumbent, rooting down, ramified. **Seeds ovoid or less trigonous, crowned with an abrupt square style, base with a**



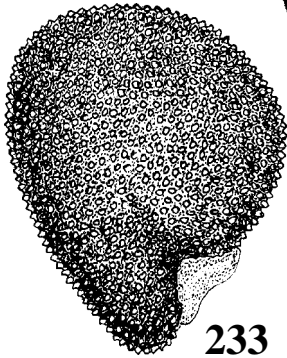
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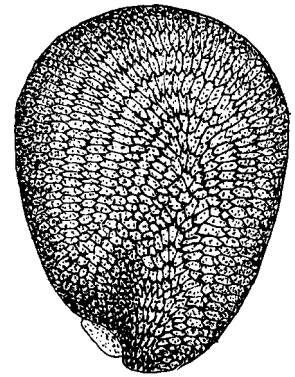
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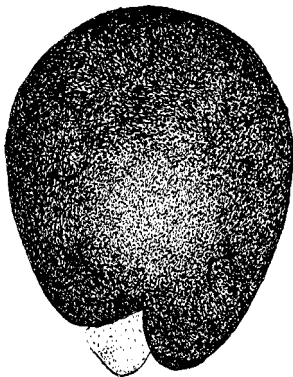
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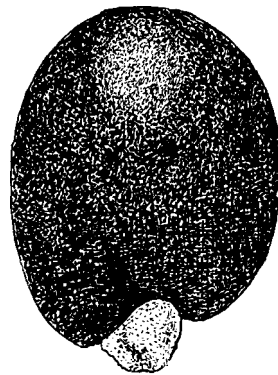
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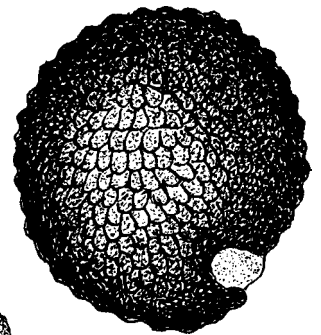
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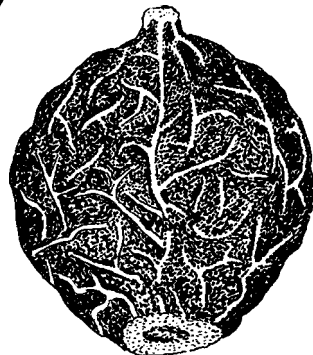
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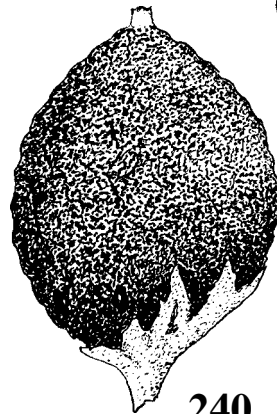
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240

shallow notch, 1-1.3 x 0.7-0.9 mm. Surface lustreless, reticulate, blackish-brown to black.  $2n = 16, 18, 32$ . Native to the Mediterranean, on seasonally wet, sandy grounds, fields and roadsides; hauling into the Carpathians, impermanent.

**241. *Paronychia cephalotes*** (M. Bieb.) Bess, *P. taurica* Borchidi et Sikura – Perennial, up to 15 cm high, minute, caespitose, ramified. **Fruits capsules (left), 1-seeded, ovoid, urceolate, longitudinal furrowed, calyx lobes as long as the perigynium part, erect, apex pointed, 2.8-3.2 x 1.3-1.5 mm. Surface downy. Seeds prolonged obovoid, slight flattish, with a very distinct hilum, 1.2-1.5 x 0.9-1.1 mm. Surface smooth, sparse sericeous, lustrous, reddish-brown.  $2n = 36$ .** Native to southern Europe; rarely in the Carpathians on basic grounds, namely limestone rocks. Hu, Mo, Ro, Uk.

**242. *Paronychia kapela*** (Hacq.) A. Kern., *Illecebrum kapela* Hacq. – Perennial, up to 15 cm high, densely leafed, tufted, much branched. **Seeds obovoid, slight compressed, 1.1-1.3 x 0.9-1 mm. Surface faint tuberculate, lustrous, glabrous, reddish-brown.  $2n = 18, 36, 54$ .** Native to the Mediterranean; very seldom extended into the Carpathians, on calcite rocks. Hu, Ro, Sk.

**243. *Illecebrum verticillatum*** L., *Paronychia verticillata* (L.) Lam. – Annual, smooth, branched to pillowy tufted, up to 30 or up to 70 cm in flooded habitats, glabrous, decumbent. **Seeds elliptic, lateral view biconvex, apex crowned with a little tip, base and apex acute, an open shallow notch at base, 0.7-0.9 x 0.3-0.4 mm. Surface high lustrous, brown to dark-brown.  $2n = 10$ .** Native to the eastern Mediterranean, in seasonally damp, sandy or gravelly places, on stripped pond-banks. Cz, Pl, Sk.

**244. *Herniaria glabra*** L. – Annual to perennial, up to 25 cm high, smooth or short downy, richly branched, creeping, long stems spreading flat on the ground. **Seeds circular or elliptic, lateral view slight compressed, margin hem in round, c. 0.5 x 0.4 mm. Surface smooth, glossy, subglabrous, dark reddish-brown.  $2n = 18, 36, 72$ .** Native to Eurasia, on dry sandbanks, in fields, stony roadsides, calcifuge; throughout the Carpathians.

**245. *Herniaria hirsuta*** L. – Annual, creeping stems slender, whole plant hairy, ramified. **Seeds obovoid or globular, lateral view biconvex, 0.4-0.5 x 0.3-0.4 mm. Surface high glossy, dark-brown to**

**blackish.  $2n = 18, 36$ .** Rarely spread in central and southern Europe and western Asia, along roadsides, in sandy fields, steppes, dry and stony places in warmer areas. Cz, Hu, Pl, Ro, Sk, Uk.

**246. *Herniaria incana*** Lam., *H. besseri* (Fisch.) DC. – Perennial, herbs, stock at base woody, ramified and stout, whole plant hispid. **Seeds obovoid, lateral view biconvex, margin hem in round, 0.7-0.9 x 0.6-0.7 mm. Surface high lustrous, glabrous, dark-brown to nigrescent.  $2n = 18$ .** Widespread in Eurasia, on calcareous, neutral, dry sandy and stony, seldom clayish soils. Cz, Hu, Mo, Pl, Ro, Sk.

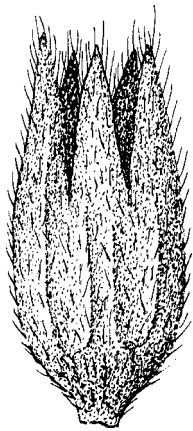
**247. *Polycarpon tetraphyllum*** (L.) L., *Alsine polycarpon* Crantz, *Mollugo tetraphylla* L. – Annual to perennial, up to 15 cm high, bare, erect or procumbent, stems forked-ramified. **Seeds minute subtriangular, biconvex, dorsal side with a longitudinal rib, 0.4-0.6 x 0.3-0.4 mm. Surface verrucose, lustrous, faint translucent, pale-brownish.  $2n = 54$ .** Originally growing in the Mediterranean, now cosmopolitan, often elsewhere, locally naturalized on rocky and gravelly places, waste grounds, fields. Ro, Sk.

**248. *Spergula arvensis*** L. subsp. *arvensis*, *S. vulgaris* Boenn. – Annual, glabrous, with ascending stems, more or less branched, 10-30 cm high. **Seeds circular or almost so with a thin yellowish margin, 0.9-1 x 0.9-1 mm. Surface pinkish, spotty.  $2n = 18$ .** Native throughout Europe, as weed of cornfields and other cultivated grounds, especially on sandy soils, sometimes used as forage. Br, Cz, Hu, Mo, Pl, Ro, Sk, Uk.

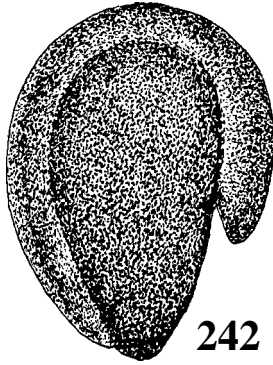
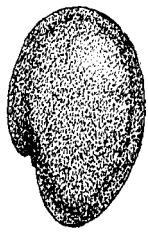
**249. *Spergula maxima*** Weihe, *S. arvensis* subsp. *maxima* (Weihe) O. Schwarz. – Annual, stems up to 1 m high, erect, considerably branched at the base. **Seeds roundish, compressed lateral, with whitish-brown semitransparent margin (0.5-0.7 mm), 0.9-1.4 mm in diam. Surface covered with brown, blunt papillae, faint lustrous.** A cosmopolite at present, once cultivated for nourishment, now wilding in some localities.

**250. *Spergula morisonii*** Boreau, *Arenaria pentadra* Wallr. – Annual, stems ascending, smooth or hispid, 10-30 cm high. **Seeds circular, lateral view flattish, slight biconvex, margin surrounded with a membranous, pale-brownish wing transversal striate, 1.3-1.7 x 1.3-1.6 mm. Surface smooth, lustreless, except for minute, club-shaped white marginal papillae, brown to black.  $2n = 18$ .** Dispersed in central Europe and northern Africa,

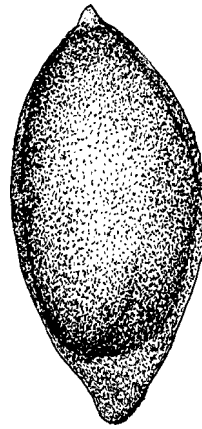




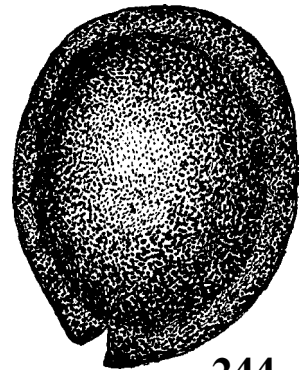
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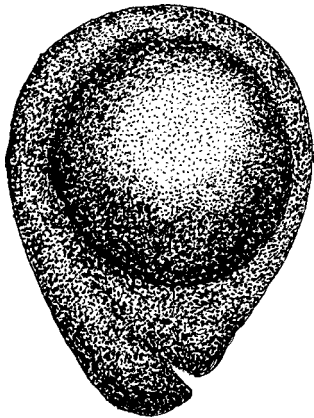
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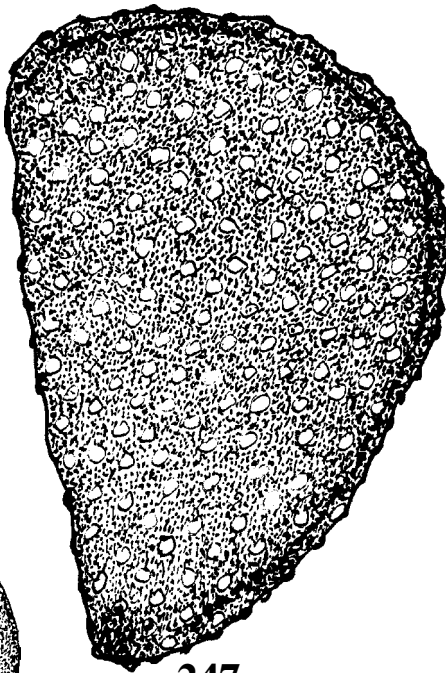
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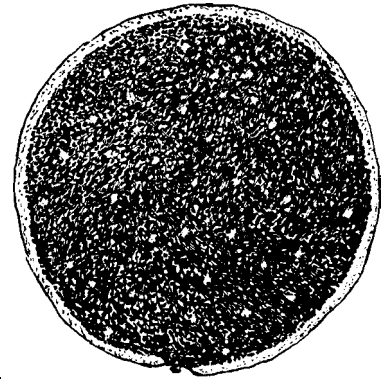
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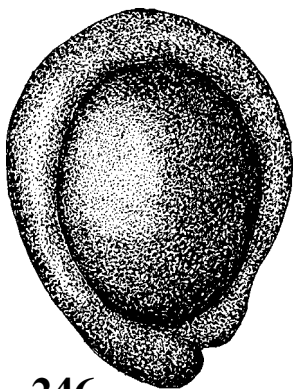
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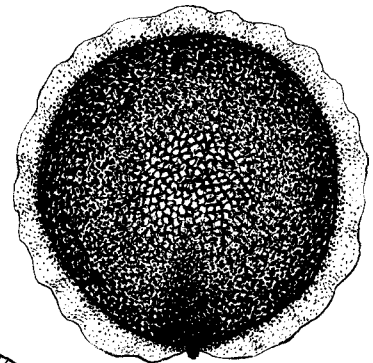
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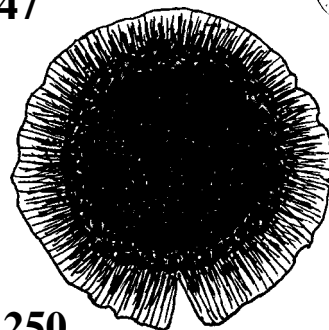
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calcifuge, in sandy open places and pine forests, in lowland and upland zones. Br, Pl, Ro, Sk, Uk.

**251. *Spergula pentandra* L., *S. vernalis* Willd.** — Annual, short shoots 10-25 cm high, glabrous or glandular. **Seeds lenticular with a white, shining wing about as wide as the seed radius, 1.4-1.8 x 1.4-1.8 mm. Surface of own seed often with white papillae near margin, tuberculate in the central part area, brown-black.** Rare European species in dry, warm, sandy places, gravelly river terraces, sparse pine forests, roadsides. Br, Cz, Hu, Pl, Ro, Sk, Uk.

**252. *Spergularia echinosperma* (Čelak.) Asch. et Graebn., *S. rubra* subsp. *echinosperma* Čelak.** — Annual or perennial, up to 15 cm high, slender, upright or procumbent, on knots rougher, with smooth, fleshy leaves. **Seeds short clavate, unwinged, 0.4-0.6 x 0.3-0.5 mm. Surface dense spinulose, black. 2n = 18.** Native to central and northern Europe, along the margins of lakes, flooded and stripped streams; rare in the Carpathians. Cz, Pl, Sk.

**253. *Spergularia media* (L.) J. et C. Presl, *S. maritima* (All.) Chiov., *Arenaria marginata* DC., *A. media* L.** — Perennial, stout, fleshy, smooth, glanduliferous-hispid in the upper part, stems up to 40 cm high. **Seeds usually winged, wing margin entirely or slight divided, translucent, 1-1.2 x 0.9-1 mm (including the wing). Surface smooth or tuberculate, lustreless, dark-brown. 2n = 18.** Euro-Siberian and Mediterranean herb, also introduced into other temperate regions of both hemispheres, on coastal and inland saline areas. Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**254. *Spergularia rubra* (L.) J. et C. Presl., *Arenaria campestris* (L.) All., *A. rubra* L., *Spergula rubra* (L.) D. Dietr.** — Annual to perennial, up to 10-25 cm high, decumbent, ascendent, with linear leaves in a bunch. **Seeds obtriangular-obovoid, thick-margined but wingless, 0.5-0.7 x 0.4-0.5 mm. Surface covered with cylindrical papillae, dull, mahogany-brown. 2n = 36, 54.** Native, probably to the Mediterranean, on sandy soils, as weed in lowland and upland zones. Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**255. *Spergularia salina* J. et C. Presl, *S. marina* (L.) Besser** — Annual to biennial, rarely perennial, with slender or slightly fleshy stock, caespitose, herbs up to 20 cm high. **Seeds obovate-obtrullate, surrounded with a distinct raised rim and sparse circular papillae, 0.6-0.8 x 0.4-0.5 mm. Surface lustrous,**

**red-brown, papillae darker. 2n = 36.** Widespread in the North Hemisphere, on coasts of Europe and inlands on saline grounds. Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**256. *Scleranthus annuus* L.** — Annual or biennial, stems up to 25 cm high, often woody, procumbent to erect, branched, shortly hairy from base. **Fruits capsules, dehiscent 1-(-2) seeded, ovoid, enclosed by the hard perianth and lanceolate sepals. Seeds widely ovoid, with a gradually narrowed bottom, 1.7-2 x 0.9-1.1 mm. Surface smooth to faint waved, dull, yellowish to tan except red crescent near acute tip. 2n = 22, 44.** Native to Europe, secondary cosmopolitan, along roadsides, in waste places, fields, lawns; throughout the Carpathian territories.

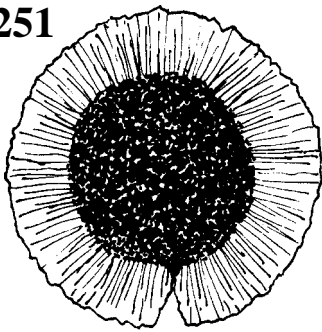
**257. *Scleranthus perennis* L.** — Perennial, up to 5-20 cm high, erect or procumbent, often with woody stock. **Fruits capsules, ovoid, faint urceolate, longitudinal 10-furrowed, calyx lobes about 1.5 of perigynium, erect, ligulate, at the apex rounded with scarious margins, 3.5-5 x 1.1-1.5 mm. Seeds pyri-form, 1.6-2 x 0.8-1 mm. 2n = 22.** Native to Europe and Asia Minor, on dry stony slopes, sandbanks, in lowlands and uplands; throughout the Carpathians.

**258. *Scleranthus polycarpus* L., *S. alpestris* Hayek** — Annual, up to 5-15 cm high, erect with stem links shorter than the leaves. **Fruits capsules, ovoid, urceolate, longitudinal 10-furrowed, calyx lobes as long as the perigynium part, erect, apex pointed, 2.5-3.5 x 1.3-1.7 mm. Surface of all fruits smooth. 2n = 44.** Native to most of Europe, wide-spread in montane and subalpine zones, on sandy soils. Cz, Hu, Ro, Sk.

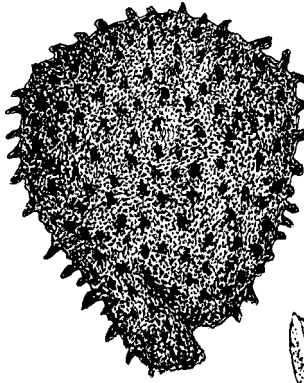
**259. *Scleranthus uncinatus* Schur** — Annual, stems ascending, up to 12 cm high, inflorescence on axillary and terminal clusters. **Fruits capsules, ovoid enclosed in the hard perianth, long sepals crooked at the apex, 3.5-4.5 x 1.2-1.4 mm.** Native to south-eastern Europe and the Carpathians, on sandy and loamy, dry pastures. Mo, Pl, Ro, Uk.

**260. *Scleranthus verticillatus* Tausch, *S. praecox* Wallr. ex Knaf** — Annual or perennial, stems 3-15 cm high, similar to *S. annuus*. **Fruits capsules, urceolate, ovoid enclosed in the hard perianth terminate by 5 lanceolate sepals, 1.7-2.5 x 1.2-1.6 mm. Surface dull, yellowish.** Native in southern and central Europe, including the Carpathians; on dry, sunny slopes, calcareous soils, abandoned vineyards, saline pastures. Cz, Hu, Sk.

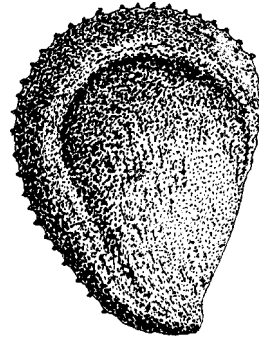
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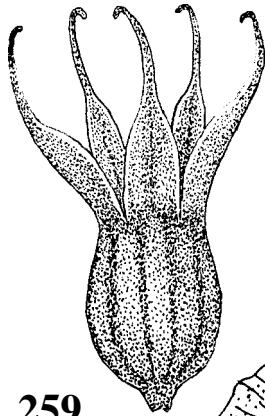
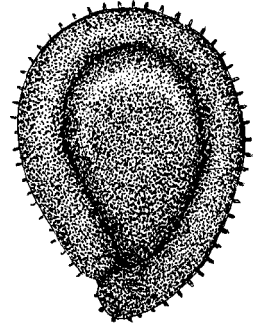
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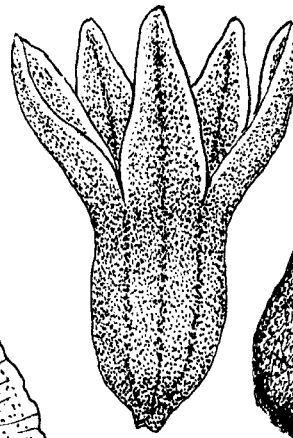
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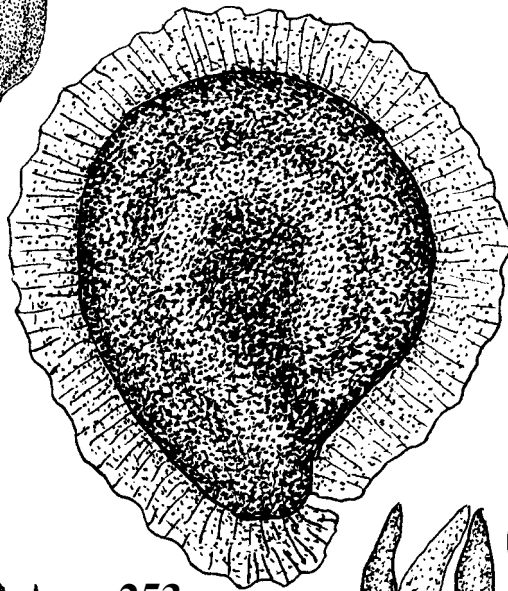
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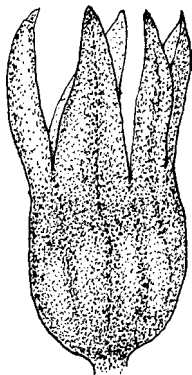
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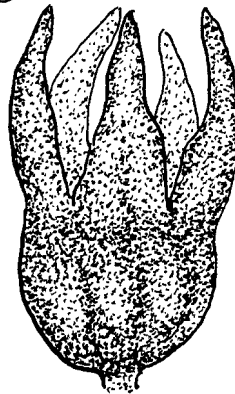
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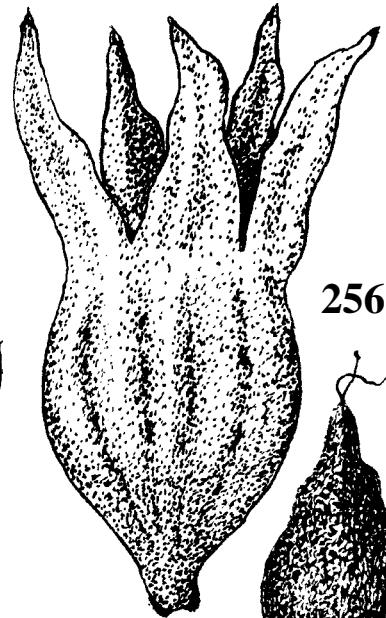
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**261. *Minuartia austriaca*** (Jacq.) Hayek, *Alsine austriaca* (Jacq.) Wahlenb. — Perennial, stems numerous, filiform, ascending up to 20 cm high, simple or ramified, glandular or sparsely glandular-pubescent. **Seeds  $\pm$  roundish, orbiculate, lateral compressed, with radicle prolonged into rounded bump, 0.9-1.2 x 0.8-1.1 mm. Surface prominent tuberculate on back and circular rows on lateral sides, slight lustrous, dark-brown.  $2n = 26, 24$ .** Native to the Alps and Carpathians, on calcareous rocks, screes and slopes. Ro (rarely).

**262. *Minuartia capillacea*** (All.) Graebn., *Alsine liniflora* (L.) Hegetschw. — Perennial, laxly caespitose with a woody stock, stems 8-30 cm, linear-setaceous, rigid, obtuse. **Seeds  $\pm$  spherical or reniform, lateral compressed, with radicle prolonged into rounded bump, 1-1.3 x 0.8-0.9 mm. Surface prominent tuberculate, at margin fimbriate, slight lustrous, brown.  $2n = 26$ .** Native to the mountains of Europe, on calcareous rocks and screes; in the Carpathians only in Romania.

**263. *Minuartia fastigiata*** (Sm.) Rchb., *M. rubra* (Scop.) McNeil, *M. jacquinii* Koch — Annual to biennial, up to 10-35 cm high, stems erect, glabrous, loosely pubescent-glandular on the upper part. **Seeds oval or reniform, with radicle prolonged into rounded bump, 0.7-0.8 x 0.5-0.6 mm. Surface tuberculate on both sides and at margin, dull or slight lustrous, brown to reddish-brown.  $2n = 26$ .** Rarely in the south, locally in warmer parts of central Europe, in dry, sandy places, stone pits, pastures, vineyards. Cz, Hu, Ro, Sk.

**264. *Minuartia frutescens*** (Kit.) Tuzson, *M. hirsuta* subsp. *frutescens* (Kit.) Hand. - Mazz. — Perennial, sparsely caespitose, up to 10-12 cm high, glandular-downy, flowering stems erect, bare above, leaves linear-lanceolate, 3-veined at the base. **Seeds obovoid, lateral compressed, dentate at margins, with radicle prolonged into rounded bump, 0.7-0.8 x 0.6-0.7 mm. Surface aculeate, faint lustrous, dark-brown.  $2n = 30, 32$ .** Native to the eastern Mediterranean, growing on sunny, stony slopes in the warmed areas, on shallow soils. Hu, Sk.

**265. *Minuartia gerardii*** (Wild.) Hayek, *Arenaria gerardii* Wild., *M. verna* subsp. *gerardii* (Willd.) Graebn. — Perennial, up to 8-12 cm, laxly caespitose, glabrous, stems glandular-pubescent above. **Seeds reniform, flattish, with radicle prolonged into rounded bump, 0.7-0.8 x 0.5-0.6 mm. Surface**

**tuberculate, slight lustrous, dark-brown.  $2n = 24$ .** Native to central Europe, in high mountains of the Alps and Carpathians, on sunny slopes, rocks and waste places. Cz, Hu, Ro, Sk.

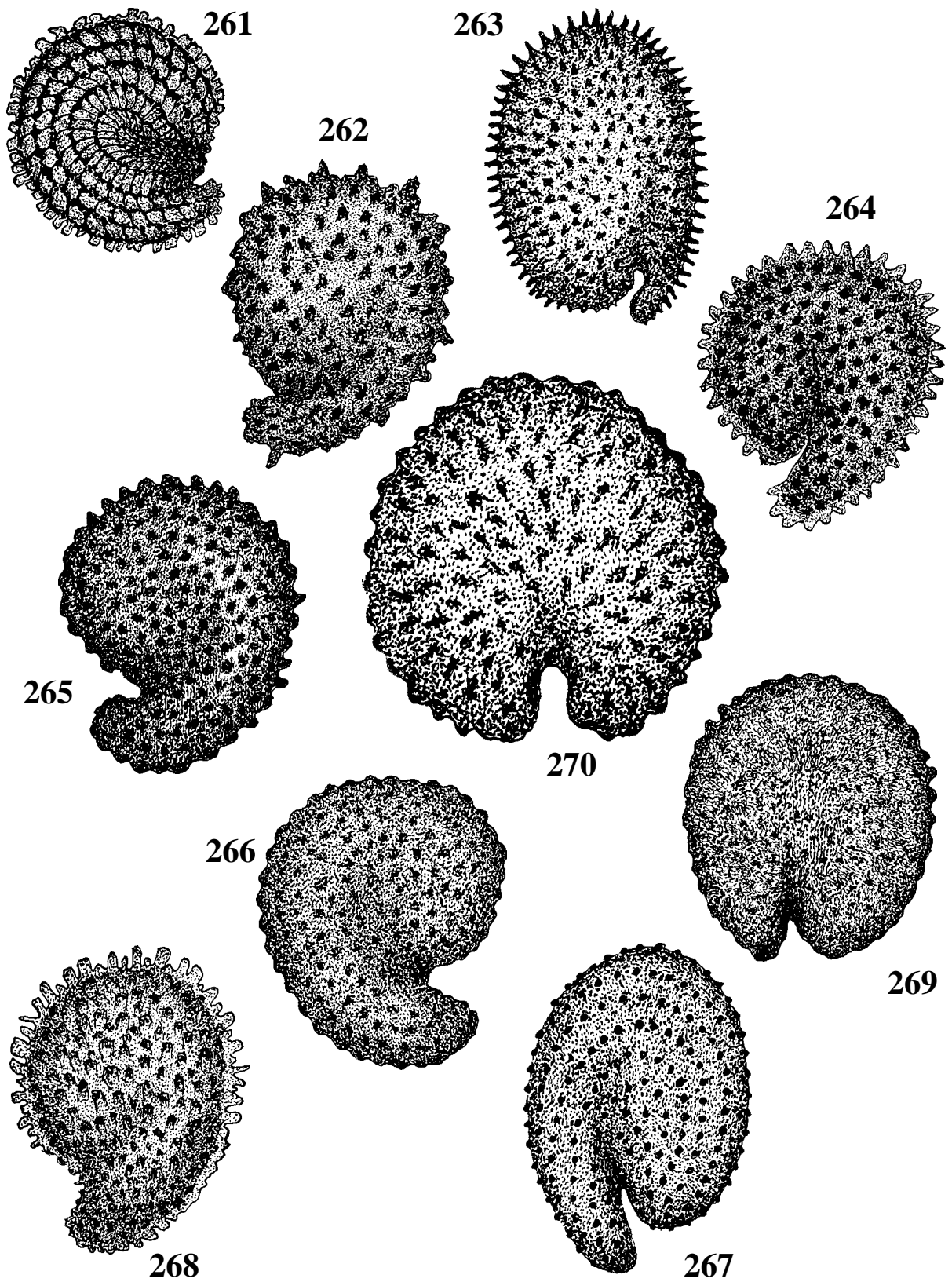
**266. *Minuartia glaucina*** Dvořáková, *M. caespitosa* Jáv. non (Ehrh.) Degen — Perennial, greyish-green plant, upper articles of the flowering stems conspicuously longer than the leaves, knots roughened. **Seeds reniform, lateral compressed, apex round, bottom narrowed, 0.6-0.7 x 0.4-0.5 mm. Surface wrinkly, faint lustrous, brown.  $2n = 48$ .** Native to Pannonia, on sandbanks. Cz, Hu, Sk.

**267. *Minuartia glomerata*** (M. Bieb.) Degen, *Arenaria glomerata* M. Bieb. — Biennial to perennial, up to 20 cm high, glandular-pubescent, stems erect. **Seeds oval or reniform, faint flattish, with radicle prolonged into rounded bump, 0.7-0.9 x 0.5-0.6 mm. Surface verrucose lustreless, light-brown or brown.  $2n = 28, 30$ .** Native in the eastern Mediterranean, northwards to Slovakia and Ukraine, on dry, sunny, loamy or stony, but non-calcareous soils and slopes. Hu, Mo, Ro, Sk, Uk.

**268. *Minuartia graminifolia*** (Ard.) Jáv., *Arenaria graminifolia* Ard. — Perennial, caespitose densely pulvinate plant, with erect unbranched, flowering stems, up to 15 cm high. **Seeds reniform to globose, flattish, with radicle prolonged into rounded bump, 1.2-1.4 x 0.9-1.1 mm. Surface verrucose, leaf-shaped excrescences at the ridge, slight lustrous, reddish-brown.  $2n = 32$ .** Endemic to the southeastern Carpathians, on calcareous grounds, rocky, sunny stands, 1200-1800 m; suitable for rock-gardens, walls. Ro.

**269. *Minuartia hirsuta*** (M. Bieb.) Hand.-Mazz., *Arenaria hirsuta* M. Bieb. — Perennial, up to 20 cm high, laxly caespitose, stems erect, glandular-downy. **Seeds oval or reniform, lateral compressed, with radicle prolonged into rounded bump, 0.8-1 x 0.7-0.9 mm. Surface on sides obscure verrucose, dull, brown to dark-brown.  $2n = 30, 32$ .** Native to southeastern Europe, on sunny, stony slopes, shallow andesite grounds and soils in warmest areas and shallow soils. Ro, Uk.

**270. *Minuartia hybrida*** (Vill.) Schischk., *Arenaria hybrida* Vill. — Annual, up to 10-20 cm high, stems bare, erect, branched at the base and from above the middle, usually glandular-pubescent. **Seeds globose or reniform, flattish, with radicle prolonged into**



**rounded bump, 0.3-0.5 x 0.3-0.5 mm. Surface fine tuberculate, slight lustrous, brown. 2n = 46.** Native to Eurasia, in dry sands and stony places, fallow fields, mainly in pioneer communities. Mo, Ro, Sk.

**271. *Minuartia langii*** (G. Reuss) Holub, *M. kitaibelii* (Nyman) Pawl. — Perennial, up to 20-30 cm high, at base woody, leaves linear-bristly. **Seeds globose or reniform, flattish, with radicle prolonged into rounded bump, 1.4-1.6 x 1.1-1.3 mm. Surface tuberculate, leaf-shaped excrescences at the ridge, slight lustrous, reddish- or dark-brown. 2n = 26.** Native to the Alps and Carpathians, on calcite and dolomite, sunny rocks, screes, 1700-2500 m. Sk.

**272. *Minuartia laricifolia*** (L.) Schinz et Thell., *Arenaria laricifolia* L. — Perennial, up to 30 cm high, fertile and sterile stems ascendent, numerous, mostly simple, laxly caespitose, woody below. **Seeds globular-reniform, flattish, margin serrate, with radicle prolonged into rounded bump, 1-1.2 x 1-1.2 mm. Surface verrucose, slight lustrous, dark-brown.** Native to mountain and high-mountain stands with granite foundations in Europe; suitable for rock-gardens and edges. Pl, Ro.

**273. *Minuartia recurva*** (All.) Schinz et Thell., *Arenaria recurva* All. — Perennial, up to 10 cm high, caespitose with numerous erect, simple, glabrous stems. **Seeds spherical or reniform, flattish, with radicle prolonged into rounded bump, 1-1.2 x 0.8-0.9 mm. Surface wrinkly, slight lustrous, pale-brown, a little darker in the middle. 2n = 30.** Native to the higher mountains of Europe, on stony grounds, screes, usually calcifuge, in the alpine zone. Ro.

**274. *Minuartia sedoides*** (L.) Hiern., *Alsine cherleri* Fenzl, *Cherleria sedoides* L. — Perennial, caespitose tufts, 5-15 cm in diam., glabrous, stems 1-5 cm high, densely leafy below. **Seeds reniform, lateral compressed, with radicle prolonged into rounded bump, 0.8-1 x 0.7-0.8 mm. Surface tuberculate, margin with higher papillae, barely lustrous, brown. 2n = 52.** Native to the mountains of Europe, on rocks, screes, stony mountain meadows. Pl, Ro, Sk.

**275. *Minuartia setacea*** (Thuill.) Hayek, *Arenaria setacea* Thuill. — Perennial, up to 10-20 cm high, caespitose, stems numerous, erect, ramified, with crispate hairs below, glabrous above. **Seeds orbicular to reniform, compressed, with radicle prolonged into rounded bump, 0.6-0.8 x 0.6-0.7 mm. Surface covered with rounded tubercles, the highest on the**

**ridge, dull, dark-brown. 2n = 24.** Native to south-eastern Europe, in lowlands and uplands, dry, stony, mostly basic foundations, in warmer areas. Cz, Hu, Mo, Pl, Ro, Sk, Uk.

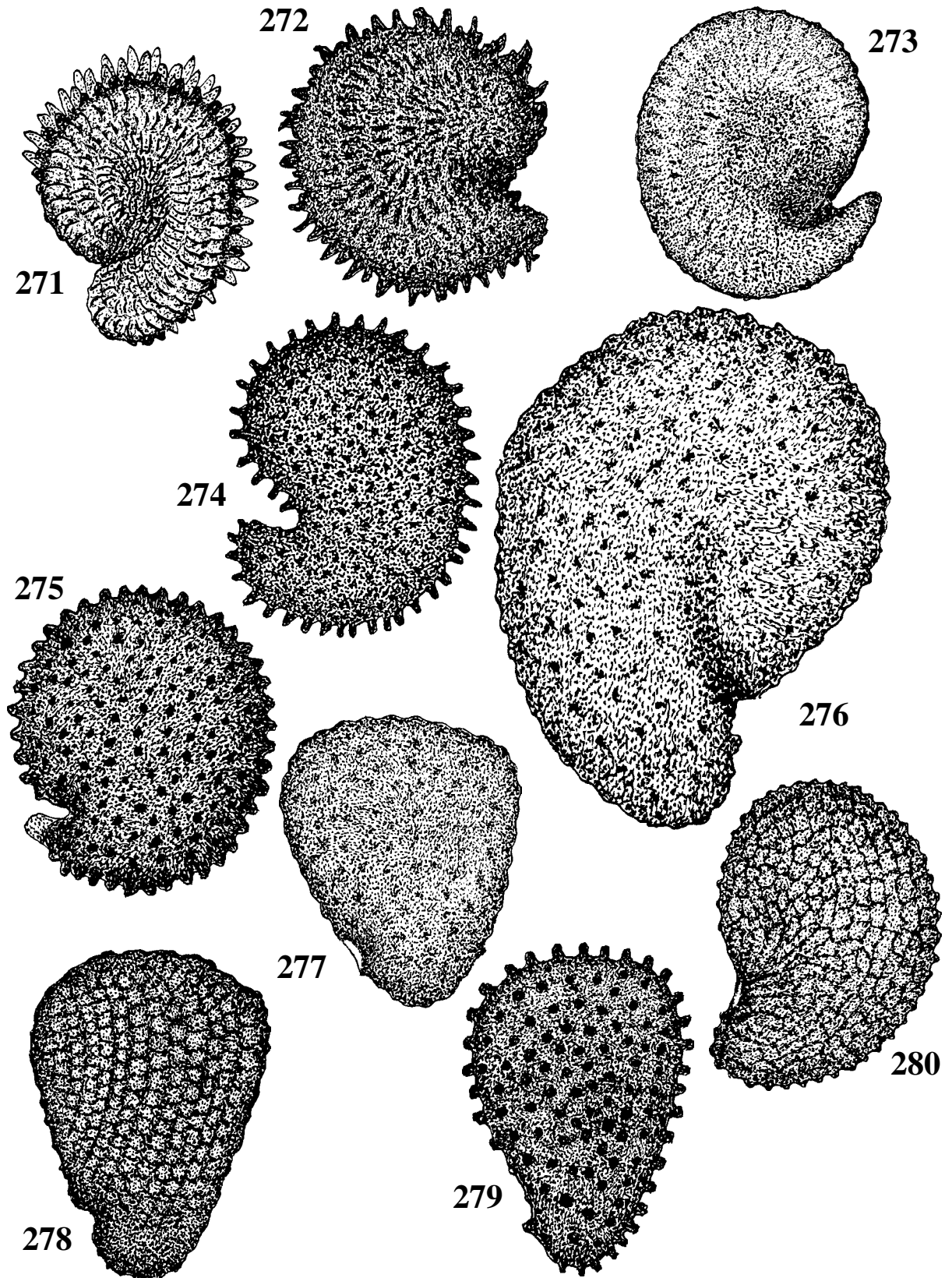
**276. *Minuartia viscosa*** (Schreb.) Schinz et Thell., *Alsine viscosa* Schreb. — Annual, up to 5-20 cm high, stems slender, upright, forkly ramified, densely glandular-pubescent. **Seeds reniform, lateral flattish, with radicle prolonged into rounded bump, 0.3-0.4 x 0.2-0.3 mm. Surface barely lustrous, tuberculate, pale-brown. 2n = 46.** Native to central and eastern Europe, on rocks, waste places, sand-banks, cultivated fields, pastures, rare. Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**277. *Sagina apetala*** Ard., *S. ciliata* Fr., *S. depressa* Schultz — Annual, up to 3-20 cm high, basal leaves in rosette, stems erect or ascending, glabrous, ramified from base, glandular above. **Seeds triangular or cuneiform, slight compressed, biconvex, base narrowed with hilum on side, 0.3-0.4 x 0.2-0.3 mm. Surface fine verrucose, faint lustrous, brown to dark-brown. 2n = 12.** Originally in the western Europe, rarely in wet sandy places, meadows, fields, forests. Hu, Pl, Ro, Sk, Uk.

**278. *Sagina maritima*** G. Don, *S. stricta* Fr. — Annual, up to 5-10 cm high, stem glabrous, usually branched from the base, numerous lateral branches varying from procumbent to erect. **Seeds triangular or cuneiform, slight flattish, biconvex, 0.4-0.5 x 0.3-0.4 mm. Surface fine verrucose, lustrous, violet-brown. 2n = 22, 24, 28.** Native on coasts along whole Europe and North Africa, occasionally in inland on saline soils. Pl, Ro.

**279. *Sagina micropetala*** Rauschert, *S. erecta* Murith non L. — Annual, up to 3-15 cm, light-green, ascending and erect, seldom procumbent stems. **Seeds triangular or cuneiform, slight compressed, 0.4-0.5 x 0.2-0.3 mm. Surface and margin covered with expressive papillae, faint lustrous, violet-brown. 2n = 12.** Native to the Mediterranean, rarely on wet and sandy fields, overflowed or wet pastures. Cz, Ro, Sk.

**280. *Sagina nodosa*** (L.) Fenzl., *Spergula nodosa* L. — Perennial, up to 5-30 cm high with procumbent or ascendent, flowering, glandular stems. **Seeds mostly reniform or cuneate, lateral view slight biconvex, testa not translucent or slight so, 0.3-0.4 x 0.2-0.3 mm. Surface barely lustrous, covered with**





**distinct papillae, dark-brown.  $2n = 20, 44, 56$ .** Throughout Europe except its southeastern part, on damp meadows, peatbogs, forests, riverbanks. Br, Cz, Hu, Pl, Ro, Sk, Uk.

**281. *Sagina procumbens* L., *S. bryoides* Froel. ex Rchb.** – Annual to perennial, up to 20 cm high, tufted with procumbent, rooting down stems and an ascendent apex. **Seeds obovate, ellipsoidal, biconvex, marginal face furrowed, testa subtranslucent, c.  $0.4 \times 0.3$  mm. Surface barely lustrous, verrucose, pale-brown, papillae slight darker.  $2n = 22$ .** Native to Euro-Siberia and North America, now cosmopolitan, common on moist fields, meadows, roadsides, and among raving-stones. Br, Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**282. *Sagina saginoides* (L.) Karst., *Spergula saginoides* L.** – Perennial, up to 10-20 cm high, tufted, with procumbent or ascendent stems, poorly branched. **Seeds mostly reniform or cuneate, flattish, biconvex,  $0.3-0.4 \times 0.3-0.4$  mm. Surface lustreless, indistinct papillose, margin slight wavy, brown.  $2n = 22$ .** Native to arctic, subarctic and high mountain areas of Eurasia, on rocks, peatbogs, riverheads. Cz, Hu, Pl, Ro, Sk, Uk.

**283. *Sagina subulata* (Sw.) C. Presl, *Spergula subulata* Sw.** – Perennial, up to 5-10 cm high, faintly tufted, flowering stems ascending. **Seeds cuneate to triangular, slight compressed,  $0.3-0.4 \times 0.25-0.35$  mm. Surface bare lustrous, covered with mostly indistinct papillae, dark-brown.  $2n = 22$ .** Native to western and central Europe, on dry meadows, riverbanks, rocks, sandy and clayey soils drying out in summer. Cz, Hu, Pl, Ro, Sk.

**284. *Eremogone cephalotes* (M. Bieb.) Fenzl, *Arenaria cephalotes* M. Bieb.** – Perennial, with woody, branched stocks, stems 20-50 cm high, stout. **Seeds  $\pm$  reniform or ellipsoid, lateral compressed, radicle much longer than cotyledons,  $1.2-1.6 \times 0.7-0.9$  mm. Surface high tuberculate, lustrous, black.** Native to southeastern Europe, on dry open slopes, in stony places and screes, steppes and forest steppes. Mo, Uk.

**285. *Eremogone longifolia* (M. Bieb.) Fenzl., *Arenaria longifolia* M. Bieb.** – Perennial, stems 20-40 cm, basal leaves 15-20 cm long, cauline leaves 5-10 cm, all plant glabrous. **Seeds reniform or obovoid, lateral compressed,  $1.4-1.6 \times 1-1.1$  mm. Surface tuberculate, on margin verrucate, slight**

**lustrous, black.** Native to eastern Europe, rarely on steppes, forest steppes, grassy slopes. Uk.

**286. *Eremogone micradenia* (Smirn.) Ikonn., *Arenaria micradenia* Smirn., *A. ucrainica* Spreng. ex Steud., *A. procera* Spreng.** – Perennial, up to 50 cm high, stems erect strongly branched, glabrous or tomentose. **Seeds reniform to circular, flattish,  $1.3-1.5 \times 0.9-1.1$  mm. Surface with low broad tubercles, margin with higher papillae, dull, black.  $2n = 22$ .** Native to central, southeastern Europe and western Siberia, rare on sandy places, sunny slopes, in pine forests and steppes, stony and dry grounds. Mo, Ro, Sk, Uk.

**287. *Eremogone rigida* (M. Bieb.) Fenzl, *Arenaria rigida* M. Bieb.** – Perennial, up to 40 cm high, caespitose, stems erect, slender, rigid, simple, glabrous. **Seeds reniform to spherical, flattish, biconvex,  $1-1.2 \times 0.8-1$  mm. Surface tuberculate, slight lustrous, reddish-brown.** Native to southeastern Europe (from the Ukraine to the Black Sea coast), on dry, usually sandy, stony or steppe slopes, sporadically at the seashores. Mo, Ro, Uk.

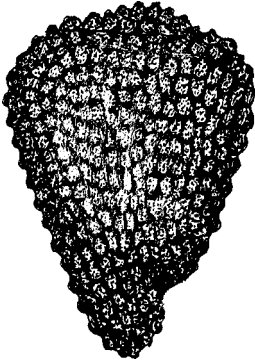
**288. *Eremogone saxatilis* (L.) Ikonn.** – Perennial, stems 30-40 cm high, basal leaves 6-12 cm long, cauline leaves 3-4 cm, inflorescence compact, multi-flowers. **Seeds  $\pm$  reniform or obtriangular, lateral compressed, radicle expressive longer than cotyledons,  $1-1.1 \times 0.8-0.9$  mm. Surface tuberculate, slight lustrous, greyish-brown.** Native to eastern Europe, rarely in pinewoods. Uk.

**289. *Cernohorskya grandiflora* (L.) Á. et D. Löve, *Arenaria grandiflora* L.** – Perennial, caespitose plant, stems 8-15 cm high, shortly hairy, flowering in June and July. **Seeds reniform, lateral compressed, margin dense cristate, radicle longer than cotyledons,  $1.8-2.2 \times 1.5-1.8$  mm. Surface fine tuberculate, dull, brown, comb reddish-brown.  $2n = 44$ .** In the Carpathians cultivated in gardens and rock-gardens as ornamental. Cz.

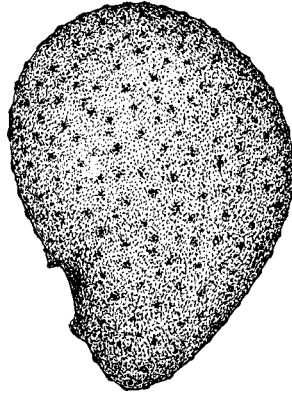
**290. *Arenaria biflora* L.** – Perennial, up to 20 cm high, stems slender, procumbent, rooting at the nodules, glabrous on rarely puberulent, branched. **Seeds reniform, biconvex, slight compressed,  $0.6-0.8 \times 0.6-0.7$  mm. Surface verrucose, dull, brownish-black to black.  $2n = 22$ .** Main mountain-ranges of Europe, from the Pyrenees to the East Carpathians, in damp places of the alpine zone, often in snow-patches, wet rocks and brookbanks. Ro.



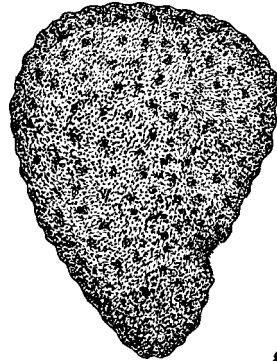
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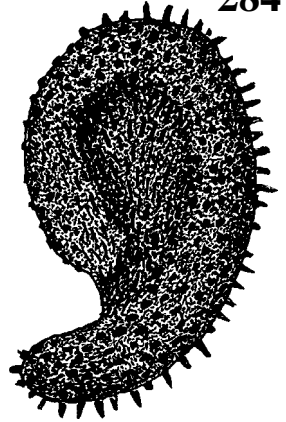
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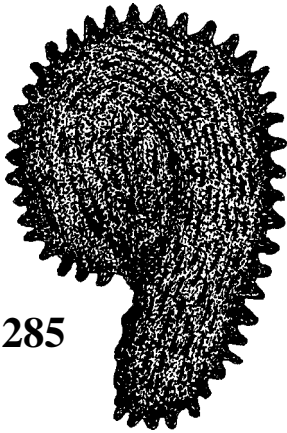
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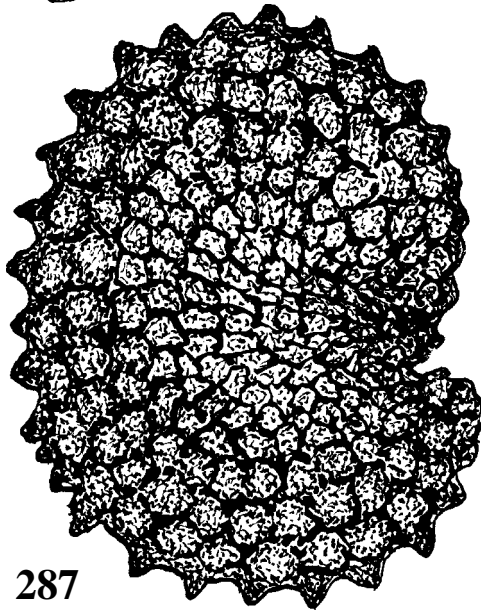
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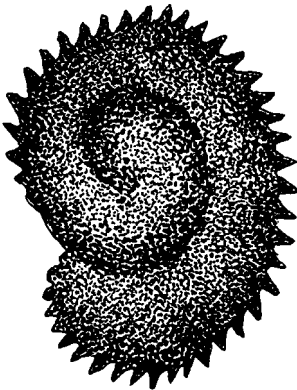
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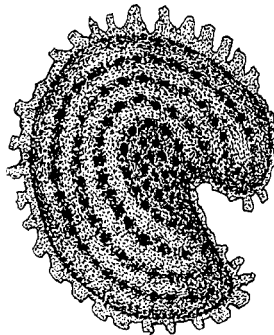
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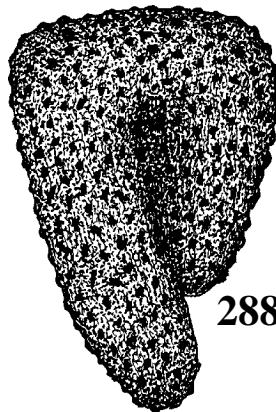
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**291. *Arenaria leptoclados*** (Rchb.) Guss., *A. serpyllifolia* var. *leptoclados* Rchb. — Annual to biennial, up to 25 cm high, stems yellowish-green, strong branched, pubescent. **Seeds variable reniform, biconvex, slight compressed, 0.4-0.6 x 0.35-0.5 mm. Surface tuberculate, dull, margin wavy, nigrescent to black. 2n = 20.** Native to the Mediterranean and Asia Minor, in lowlands and uplands, in dry light soils, fallows, often among rocks and rubbish places. Cz, Hu, Ro, Sk, Uk.

**292. *Arenaria purpurascens*** Boiss. — Perennial, stems 7-10 cm high, with narrow grassy leaves, flowers simple, minute, pink. **Seeds ± ellipsoid or obovoid, lateral slight compressed, with a hilum on one side, 1.4-1.8 x 1.1-1.3 mm. Surface smooth, glossy in central parts of the sides, fine granulate on the margins, black.** Native to the Pyrenees mountains; in the Carpathians rarely cultivated in rock-gardens, flower-beds and flowerpots.

**293. *Arenaria serpyllifolia*** L., *Alsine serpyllifolia* (L.) Crantz — Annual or biennial, relatively robust, up to 30 cm high, stems at base ramified, upright or ascending, rough downy. **Seeds reniform to circular, slight biconvex and flattish, 0.4-0.6 x 0.4-0.5 mm. Surface barely lustrous, faint verrucose, margin wavy, dark- to black-brown or nigrescent. 2n = 40.** Native to Eurasia, in dryer areas, fields, fallows, sandy places, roadsides, growing in communities, in ruderalized areas; throughout the Carpathians.

**294. *Arenaria stenophylla*** Ledeb., *A. procera* Spreng., *Alsine oxypetala* Woloszcz. — Perennial, stems 5-15 cm high, leaf margins glandularly hirsute. **Seeds reniform, lateral compressed, with dentate margin, radicle longer than the cotyledons, 1.4-1.8 x 1-1.3 mm. Surface rough, dull, black. 2n = 22.** Native to Eurasia, on sunny, grassy slopes, light, shrubby woods. Br, Uk.

**295. *Arenaria tenella*** Kit., *A. ciliata* L. subsp. *tatrensis* (Zapał.) Favarger — Perennial, sterile and fertile stems very numerous, created densely, low, caespitose turfs, stems scabrous, only 5-10 cm high. **Seeds reniform, slight compressed, dorsal side convex, ventral concave, 1.3-1.5 x 1-1.2 mm. Surface with low broad tubercles in concentric rows, dull, dark-brown to black. 2n = 40.** Native to Europe, on open habitats, basic soils, mountain rocks, reinforced screes, 1600-3000 m. Pl, Ro, Sk.

**296. *Arenaria uralensis*** Pall. ex Spreng. — Annual, stems 10-30 cm high, leaves 3-10 mm long, with ± ascending veins. **Seeds ± reniform, lateral compressed, 0.5-0.55 x 0.5-0.55 mm. Surface reticulate-areolate, slight lustrous, brown to dark brown.** Native to Europe, weed on waste places. Uk.

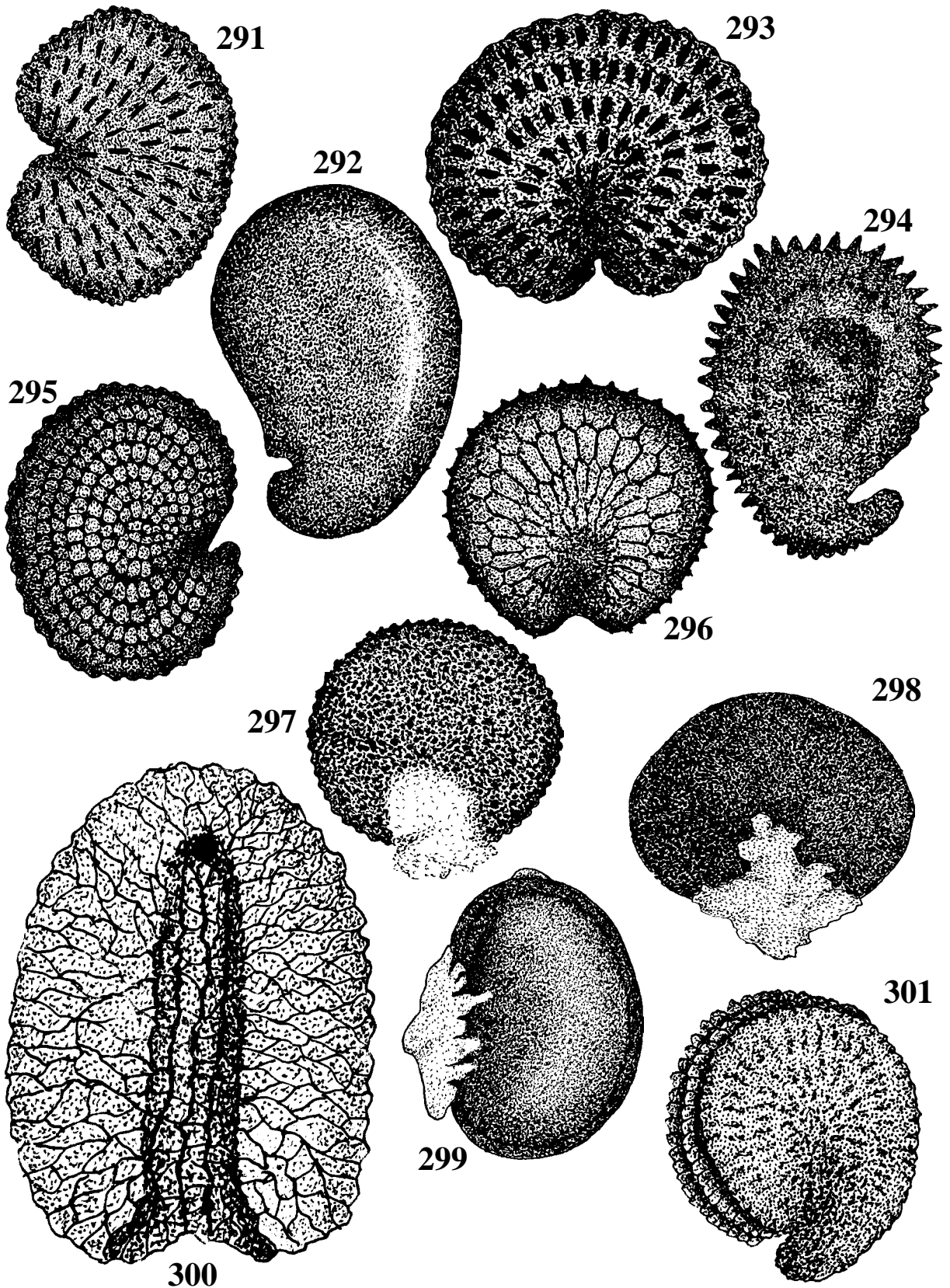
**297. *Moehringia grisebachii*** Janka — Perennial, up to 5-20 cm high, with numerous filiform, rigid, intricate, shortly hirsute stems. **Seeds subglobose with whitish caruncula on bottom part, 0.9-1.2 x 0.9-1 mm. Surface radial fine tuberculate, glossy, black.** Native to the Balkan Peninsula, on shady rock slits in montane zones, calcifuge. Ro.

**298. *Moehringia muscosa*** L., *Alsine moehringia* Crantz — Perennial, up to 20 cm high, tufted, stems tender, glabrous, procumbent or ascendent. **Seeds reniform to circular with a persistent yellowish caruncula, 1.1-1.3 x 0.9-1 mm. Surface lustrous, smooth, reddish-black. 2n = 24.** Native to southern and central Europe, on mountain stony, mostly calcareous slopes, along margins of coniferous forests; sometimes cultivated in rock-gardens. Hu, Pl, Ro, Sk, Uk.

**299. *Moehringia trinervia*** (L.) Clairv., *Arenaria trinervia* L. — Annual or perennial, up to 40 cm high, stems procumbent or ascending, downy. **Seeds reniform to circular, marginal face with sharp keel, caruncula 0.4-0.5 mm, 0.7-0.9 x 0.9-1.1 mm. Surface radial, fine striate, glossy, reddish-black to black. 2n = 24.** Native to Eurasia, in deciduous and mixed woodlands, margins of coniferous forests, on moist loamy soils; throughout the Carpathians.

**300. *Holosteum umbellatum*** L., *Arenaria umbellata* (L.) Clairv. — Annual, up to 10-30 cm high, single stems erect, simple or branched, usually glandular-viscid. **Seeds asymmetrical reniform and lateral expanded or shield-shaped, dorsal side with a wide shallow furrow, lateral view dorsoventral compressed, with a slight apical notch, 0.8-1 x 0.6-0.8 mm. Surface covered with stelliform papillae, faint lustrous, reddish-brown. 2n = 20.** Widespread in Eurasia, northern Africa, in road verges, fallows, sandy and loamy soils, as weed in fields. Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**301. *Moenchia erecta*** (L.) P. Gaertn. et all., *M. quaternella* Ehrh., *Sagina erecta* L. — Annual, up to 2-10 cm high with ascendent or erect basal branched stems. **Seeds reniform to circular, slight**



compressed, margin rounded, 0.6-0.7 x 0.5-0.6 mm. Surface radial verrucose, dull or faint lustrous, greyish-black.  $2n = 36$ . Native to southern and central Europe, on dry grasslands, hills, steppes, sandbanks, rare. Cz, Pl, Sk.

**302. *Moenchia mantica* (L.) Bartl., *Cerastium manticum* L.** — Annual, up to 10-30 cm high, erect, simple, glabrous, bracts very broadly white-margined. **Seeds reniform or triangular, furrowed at margin, 0.6-0.8 x 0.6-0.7 mm. Surface tuberculate, dull, orange-brown.  $2n = 38$ .** Native to southeastern Europe, on grass-plots in warmer and moister areas of lowlands, uplands, seldom in mountains. Cz, Hu, Pl, Ro, Sk.

**303. *Myosoton aquaticum* (L.) Moench, *Malachium aquaticum* (L.) Fr.** — Perennial, sterile stems short, flowering up to 20-120 cm, brittle, non-ramified, creeping at base, ascending, glandular-hairy above. **Seeds reniform or circular, biconvex, slight flattish, margin rounded, 0.8-1 x 0.9-1.1 mm. Surface lustreless, covered with comb- to stelliform papillae, orange to dark-brown.  $2n = 28$ .** Native to Eurasia, on moist places, brook borders, ditches, shrubberies, from lowland to subalpine zones in the whole Carpathians.

**304. *Dichodon cerastoides* (L.) Rchb., *Cerastium cerastoides* (L.) Britton, *Stellaria cerastoides* L.** — Perennial, usually glabrous, laxly tufted, smooth, barren, twigs creeping, blossomy ascendent to 15 cm high. **Seeds circular or reniform, slight flattish, 1-1.2 x 0.8-1 mm. Surface covered with papillae, lustreless, dirty yellowish-orange.  $2n = 38$ .** Eurasia, on springheads, mountain meadows, moist wastes, snow deck-chairs, at higher positions in mountains. Pl, Ro, Sk, Uk.

**305. *Dichodon viscidum* (M. Bieb.) Holub, *Stellaria viscida* M. Bieb., *Cerastium dubium* (Bastard) Guepin** — Annual, up to 40 cm high, caespitose, glandular-downy, stems erect. **Seeds subcircular, flattish, marginal face arranged in one or two longitudinal rows, 0.6-0.7 x 0.6-0.7 mm. Surface covered with rounded tubercles, slight lustrous, yellowish-brown.  $2n = 38$ .** Native to Eurasia, rarely on moist saline sandy places, road and riverbanks. Cz, Mo, Ro, Sk.

**306. *Stellaria alsine* Grimm, *S. uliginosa* Murray** — Perennial, up to 40 cm high, stems 4-angled, creeping, procumbent to ascending, rooted down,

glabrous, smooth. **Seeds reniform to globular, lateral compressed, 0.5-0.7 x 0.4-0.6 mm. Surface ribbed wrinkly, dull, greyish or reddish-brown.  $2n = 24$  (26).** Native to the south of Eurasia, only on mountain bog-meadows, springheads, scattered, up to the alpine zone, especially on non-calcareous grounds. Br, Cz, Hu, Pl, Ro, Sk, Uk.

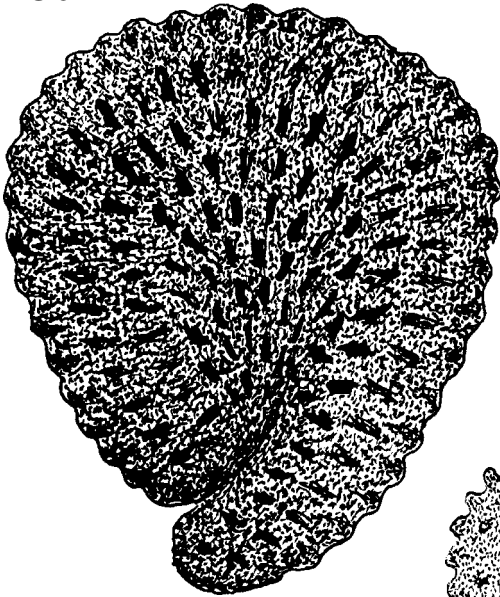
**307. *Stellaria crassifolia* Ehrh.** — Perennial, up to 10-40 cm high, stems creeping, upper parts ascending, glabrous, quadrangular. **Seeds circular or slight ellipsoid, marginal notch shallow, lateral view biconvex, 0.8-1 x 0.6-0.8 mm. Surface barely lustrous, indistinct wrinkly by papillae, light-brown.  $2n = 26$ .** Native to northern Europe, scattered on wet meadows, peatbogs, sea-shores, sandbanks. Br, Pl, Uk.

**308. *Stellaria graminea* L.** — Perennial, up to 1 m high, stems feeble, ascending, much-branched, quadrangular, smooth. **Seeds ellipsoidal or circular, little flattish, biconvex, 0.8-1.1 x 0.7-0.8 mm. Surface lustreless, strong wrinkly, dark red-brown, papillae greyish.  $2n = 26, 39, 52, 104$ .** Native to northern Eurasia, except the extreme south, grows from lowlands up to the alpine zone, on dry meadows, fields, shrubberies, pastures, in sandy and leamy soils; throughout the Carpathians.

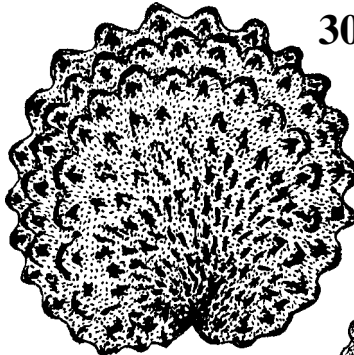
**309. *Stellaria holostea* L.** — Perennial, up to 60 cm high, stems erect, weak, diffuse, ascending, 4-angular at the base. **Seeds reniform, slight compressed, ventral side truncate, lateral view biconvex, marginal face convex, 1.9-2.2 x 2.1-2.6 mm. Surface prickly, all over with cylindrical papillae, dull, dark purple-brown.  $2n = 26$ .** Native to northern and central Eurasia, in deciduous and mixed woodlands, thickets and clearings, from lowland to mountain zones; in the whole Carpathians territory.

**310. *Stellaria longifolia* Mühlenb. ex Willd., *S. diffusa* Schlecht., *S. frieseana* Ser.** — Perennial, up to 25-50 cm high, stems creeping, upper part ascending, ramified, 4-angular, rough at angles. **Seeds reniform, ellipsoid or globular, biconvex, marginal face rounded, 0.8-1 x 0.7-0.8 mm. Surface covered with comb-shaped papillae, lustreless, greyish-brown.  $2n = 26$ .** Native to northern Europe, on peatbogs, inundated coniferous woods, margins of water boundaries. Br, Cz, Pl, Ro, Sk, Uk.

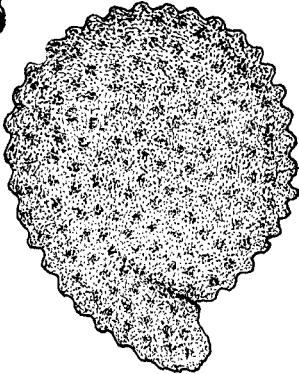
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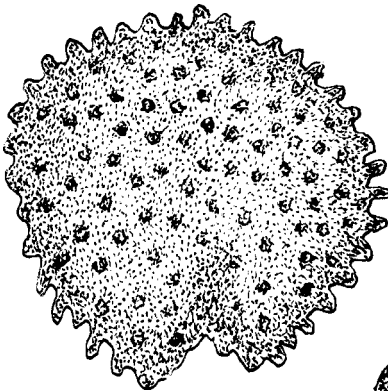
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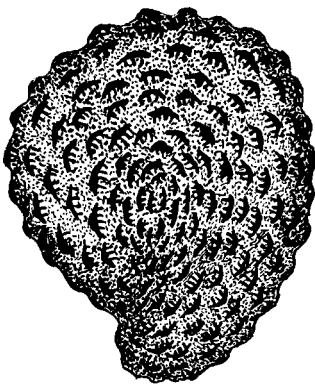
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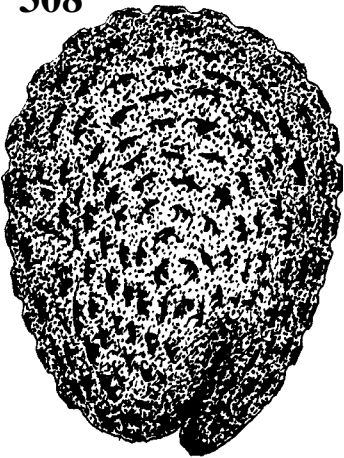
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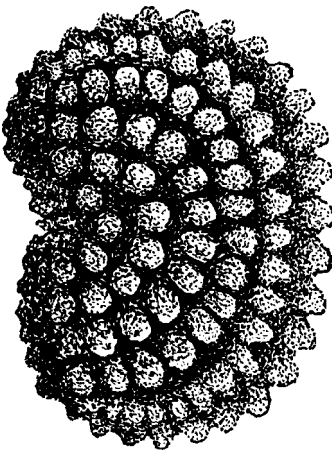
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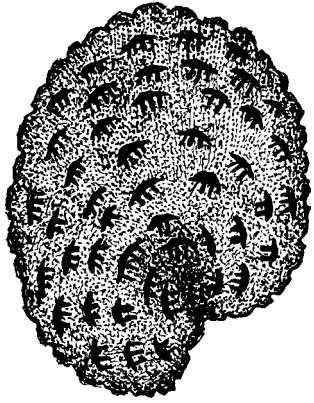
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**311. *Stellaria media*** (L.) Vill., *Alsine media* L. — Annual or biennial, up to 10-40 cm high, stems branched, procumbent or ascending, roundish. **Seeds circular or circular-obovate, lateral view slight biconvex, margin flat or furrowed, 0.9-1.1 x 0.9-1.1 mm. Surface lustreless, covered with stelliform papillae, dark-brown.  $2n = 40, 42, 44$ .** Native to northern Eurasia, now cosmopolitan, common weed on cultivated fields, waste grounds, from lowland to alpine zones; throughout the Carpathians.

**312. *Stellaria neglecta*** Weihe, *Alsinula neglecta* (Weihe) Dostál — Biennial, up to 80 cm high, stems branched, ascending, eglandular, with 1 line of hairs down each internode. **Seeds circular or circular-obovate, often irregular, biconvex or flattish, 1.3-1.6 x 1.3-1.6 mm. Surface covered with stelliform papillae, margin irregular prickly, brown to dark-brown.  $2n = 22$ .** Native to southern and central Eurasia, on moist lowland forests, river and brook deposits, and shrubberies. Hu, Ro, Uk.

**313. *Stellaria nemorum*** L., *Alsine nemorum* (L.) Schreb. — Perennial, up to 60 cm, stems with runners, terete, branched only in the lax, glandular-hispid on upper parts. **Seeds elliptic or circular, slight compressed, biconvex, margin rounded, 0.8-1.1 x 0.9-1 mm. Surface covered with stelliform papillae, margin prickly, dull, reddish-brown.  $2n = 26$ .** Native in most of Europe, except the extreme north and south, frequently in humous-rich, moist, shady places, shrubberies, forest borders, in upland and subalpine zones. Br, Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**314. *Stellaria pallida*** (Dumort) Piré, *Alsine pallida* Dumort. — Biennial, up to 30 cm high, stems numerous, very slender, with 1 line of hairs down each internode. **Seeds circular or circular-obovoid, marginal notch appressed, marginal face flat, 0.7-0.9 x 0.6-0.8 mm. Surface with rounded or conical tubercles, testa subtranslucent, slight lustrous, pale yellowish-brown.  $2n = 20, 22$ .** Originally growing in Europe, eastwards to the Ukraine, Asia Minor, on blown sands, light forests, waste grounds, roadsides, in dryer areas. Hu, Pl, Ro, Sk, Uk.

**315. *Stellaria palustris*** Retz. *S. glauca* With. — Perennial, up to 60 cm high, growing erect from the procumbent base, stems 4-angled. **Seeds elliptic or circular, flattish, marginal face arranged in definite, longitudinal rows, 1-1.4 x 0.9-1.1 mm. Surface covered with comb-shaped papillae, lustre-**

**less, greyish-brown to brown.  $2n = c. 130, 174-182$ .** Native to northern and central Europe, extending southwards to the Ukraine, from lowland to subalpine zones, common in peatbogs. Br, Cz, Hu, Pl, Ro, Sk, Uk.

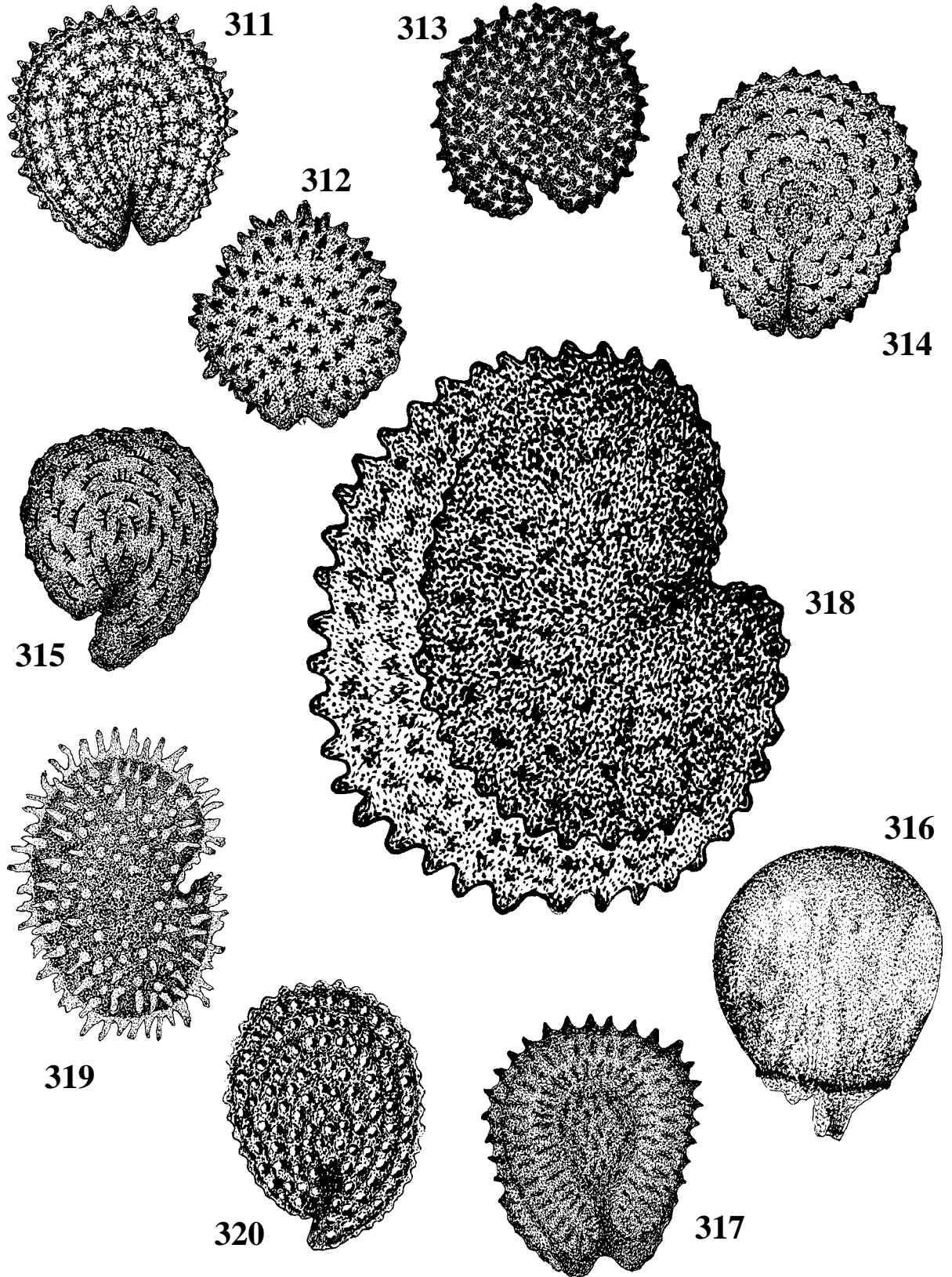
**316. *Honkenya peploides*** (L.) Ehrh., *Ammadenia peploides* (L.) Rupr. — Perennial, with trailing, succulent stems rooting at the nodes, glabrous, stems 15-30 cm high, 4-angular. **Seeds  $\pm$  spherical, lateral view slight compressed, apex rounded, bottom truncate with the rest of the funiculus, 3-4 x 2-3.7 mm. Surface faint waved or smooth, lustrous, reddish-brown.  $2n = 66, 68-70$ .** Native to northern and western Europe, on maritime sands and shingle, a very rare inland species. Pl.

**317. *Cerastium alpinum*** L. — Perennial, up to 20 cm high, stems densely glandular on the upper part. **Seeds cuneate, compressed, side faces concave, marginal face slight concave, 1.4-1.8 x 1.2-1.5 mm. Surface lustreless, acutely tuberculate, margin prickly, reddish-brown.  $2n = c. 54, 72 (144)$ .** Native to arctic and subarctic Europe, and in the main-mountain ranges of Europe, in the subalpine and alpine zones, on dry wind-exposed humous, calcifuge stands. Pl, Ro, Sk.

**318. *Cerastium arvense*** L. — Perennial, up to 5-30 cm high, tufted, ascendent, non-flowering stems densely leafy. **Seeds circular or reniform, compressed, marginal face flat or concave, 1-1.4 x 1-1.2 mm. Surface with close, distinct papillae, margin prickly, dull, reddish-brown.  $2n = 72$ .** Native to Eurasia, fairly common on dry banks, in grassland, weed in cereal fields, on roadside verges. Br, Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**319. *Cerastium banaticum*** (Rochel) Heuffel, *C. grandiflorum* Waldst. et Kit. subsp. *banaticum* Rochel — Perennial, up to 40 cm high, caespitose, finely hirsute, sometimes glandular. **Seeds ellipsoid or reniform, lateral sides concave, marginal face concave, 1.6-1.9 x 1.1-1.3 mm. Surface covered with long papillae, lustreless, reddish-brown.** Native to the eastern Balkan Peninsula up to Asia Minor, on stony and grassy habitats. Ro.

**320. *Cerastium biebersteinii*** DC. — Perennial, up to 10-30 cm high, caespitose, white-lanate, uppermost internode up to 10 cm. **Seeds oval or reniform, flattish, lateral side slight concave, 1.2-1.4 x 0.9-1.1 mm. Surface pustulate, lustreless,**





**dark-brown. 2n = 36, 38, 72, c. 108.** Native to the Crimea; in the Carpathians commonly planted as ornamental in gardens, cemeteries, parks, often naturalized.

**321. *Cerastium brachypetalum*** Desp. ex Pers. — Annual, up to 40 cm high, glandular-hairy, flower stems, tomentose. **Seeds circular or horseshoe-shaped, compressed, marginal notch shallow, 0.6-0.8 x 0.6-0.7 mm. Surface tuberculate, papillae rather close, dull, orange-brown. 2n = c. 90.** Native southeastern and central Europe up to Asia Minor, on dry turf verges, warm chalky loams and synantropic communities, from lowland to montane zones. Cz, Hu, Pl, Ro, Sk.

**322. *Cerastium caespitosum*** Gilib., *C. vulgatum* L., *C. triviale* Link, *C. viscosum* L. — Perennial, stems up to 10-50 cm high, often laxly caespitose, with leafy basal shoots, pubescent to glabrescent, with or without glandular hairs. **Seeds rounded triangular, flattish, marginal face slight concave, 0.7-0.9 x 0.7-0.9 mm. Surface dull, tuberculate, orange-brown. 2n = 144.** Native to Europe, on cultivated fields, roadsides, forest margins; in the whole Carpathians.

**323. *Cerastium candidissimum*** Correns — Perennial, stems up to 30-40 cm high, tomentose, with stellate-branched hairs. **Seeds rounded, lateral flattish, radicle as long as cotyledons, 1.4-1.6 x 1.3-1.5 mm. Surface distinct tuberculate, faint lustrous, reddish-brown.** Native to Greece, often cultivated in rock-gardens.

**324. *Cerastium carinthiacum*** Vest, *C. latifolium* Clairv. auct. non L. — Perennial, up to 10-20 cm high, loosely matted, nearly smooth, shoots ascending to erect. **Seeds irregular circular, lateral compressed, 1.8-2.2 x 1.8-2.2 mm. Surface sinuate, low tuberculate, papillae one-sided, comb-shaped in distinct concentric situated rows, lustreless, pale-brown. 2n = 36.** Native to the Alps and Carpathians, on stony calcareous places shrubberies, up to 2200 m elevation. Pl, Ro, Sk.

**325. *Cerastium diffusum*** Pers., *C. tetrandrum* Curtis — Annual, up to 30 cm high, stem with glandular and usually some eglandular hairs. **Seeds ± obovoid or obtriangular, lateral compressed, apex truncate, bottom narrowed, 0.7 x c. 0.6 mm. Surface blunt tuberculate, slight lustrous, yellowish to chestnut-brown. 2n = 36, 72.** Native to Europe, on sandy stands. Hu, Pl, Sk.

**326. *Cerastium eriophorum*** Kit., *C. alpinum* L. subsp. *lanatum* (Lam.) Asch. et Graebn. — Perennial, up to 5-10 cm high, white lanate, non-glandular. **Seeds reniform to circular, flattish, lateral sides concave, marginal face slight furrowed, 1.1-1.5 x 1-1.2 mm. Surface fine verrucose, dull, reddish-brown. 2n = 72.** Native to the Alps and High Tatras, rare on dry calcareous rocks and wastes. Pl, Ro, Sk, Uk.

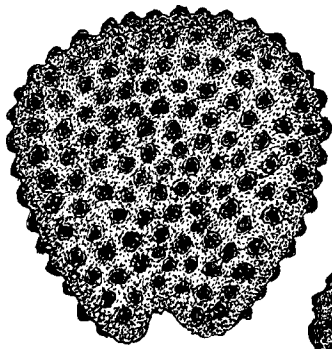
**327. *Cerastium fontanum*** Baumg., *C. macrocarpum* Schur — Perennial, up to 30-60 cm high, stems upright or prostrate, rough, densely hirsute, sterile shoots numerous. **Seeds angular cuneate, flattish, marginal notch shallow, furrowed, 0.7-0.8 x 0.7-0.8 mm. Surface covered with low papillae, lustreless, dark orange-brown. 2n = 144.** Native to Europe, on meadows, in weedy fields, on moist loamy soils rich in nutrients; in all Carpathian mountains.

**328. *Cerastium glomeratum*** Thuill., *C. viscosum* auct. non L. — Annual, up to 40 cm high, yellowish-green, stems with eglandular or glandular hairs, shortly tomentose, erect. **Seeds cuneate, flattish, marginal notch shallow or flat, with rounded apex, 0.4-0.6 x 0.4-0.6 mm. Surface verrucose, barely lustrous, light-brown. 2n = 72.** Native to Eurasia, on roadsides, waste places, fallows, fields, shrubberies; especially in uplands in the whole Carpathians.

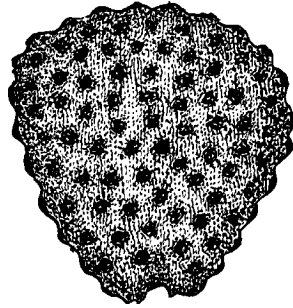
**329. *Cerastium glutinosum*** Fr., *C. pallens* F. W. Schulz — Annual, up to 14 cm high, stalks yellowish-green, sparsely glandular. **Seeds cuneate or rounded, flattish, marginal face furrowed, 0.4-0.6 x 0.3-0.5 mm. Surface lustreless, papillae stelliform, orange-brown. 2n = 70-72.** Native to central and southern Europe, in lowlands, rarely in mountains, in dry, sunny, grassy and rocky places, shrubberies, boundaries. Hu, Mo.

**330. *Cerastium holosteoides*** Fries, *C. vulgare* Hartm. — Annual, up to 5-50 cm high, loosish prostrate, stems ascendent, downy. **Seeds cuneate, compressed, slight biconvex, marginal face furrowed, 0.6-0.8 x 0.5-0.7 mm. Surface verrucose, papillae arranged in rows, slight lustrous, orange-brown. 2n = 144.** Circumpolar species growing on meadows, grassy places, boundaries, fallows, from lowland up to mountain zones. Cz, Mo, Ro, Sk, Uk.

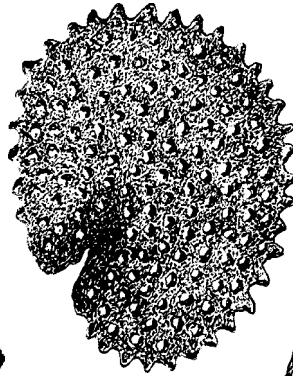




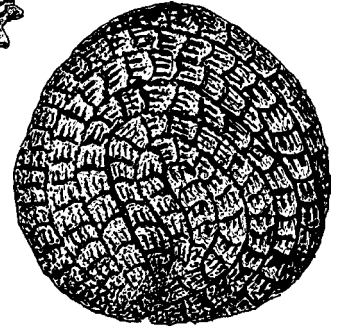
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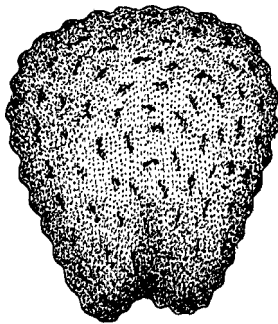
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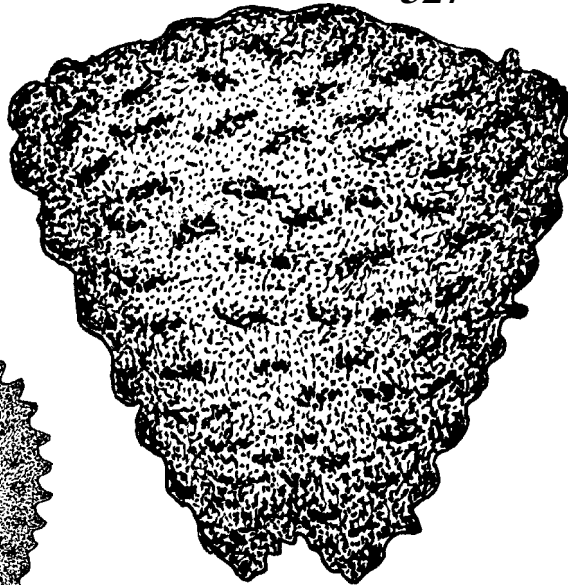
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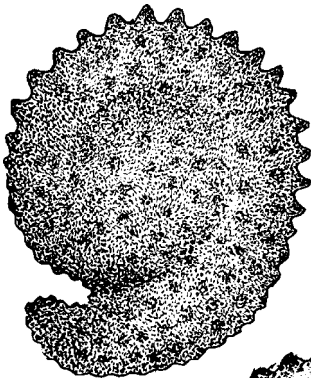
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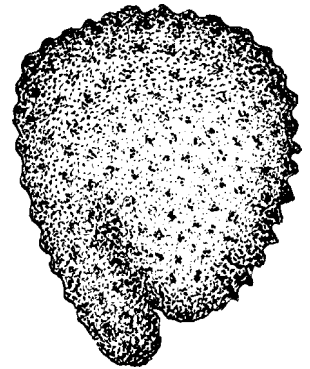
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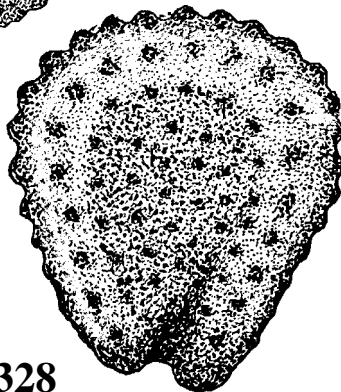
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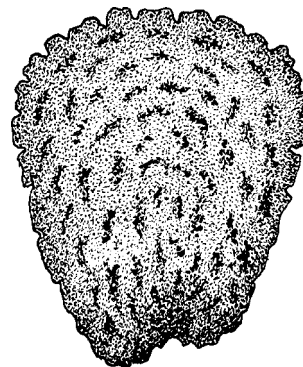
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**331. *Cerastium pumilum*** Curtis, *C. obscurum* Chaub. — Annual, up to 14 cm, stems non-branched, densely glandular, scattered hairy, often reddish below. **Seeds angular cuneate, flattish, marginal face slight furrowed, apex slight rounded, 0.5-0.6 x 0.45-0.55 mm. Surface fine verrucose, papillae, barely lustrous, dark-brown.  $2n = 90, 95$ .** Native to Eurasia, on dry sandy pastures, embankments, roadsides, fallows. Cz, Hu, Pl, Ro, Sk.

**332. *Cerastium semidecandrum*** L., *C. viscidum* Link — Annual, up to 20 cm high, stems procumbent to erect, stickily hairy, branched at the base. **Seeds cuneate, subtriangular, compressed, marginal notch shallow, 0.4-0.5 x 0.3-0.4 mm. Surface lustreless, verrucose, papillae indistinct and sparse, light-orange.  $2n = 36$ .** Native to Eurasia except the extreme north, common in dry sandy and stony soils, scattered all over country; in the whole Carpathians.

**333. *Cerastium strictum*** L. subsp. *strictum* — Perennial, densely caespitose, stems 30-40 cm high, glandular above. **Seeds  $\pm$  rounded or reniform, lateral flattish, radicle a little longer than cotyledons, 1.1-1.3 x 0.9-1.1 mm. Surface rough tuberculate, faintly lustrous, rusty-brown.  $2n = 36$ .** Native to the Alps and Carpathians, on calcareous rocks, grassy and stony localities, in subalpine and alpine zones. Pl, Sk.

**334. *Cerastium sylvaticum*** Waldst. et Kit. — Biennial or perennial, up to 60 cm high, sparsely tufted, stems creeping, leafy, flowering shoots glandular and felted, ascending. **Seeds obovoid, flattish, marginal notch deep, 1.2-1.6 x 1.1-1.3 mm. Surface dense tuberculate, lustreless, dark-brown.  $2n = 36$ .** Native to eastern Europe, in moistly, humous deciduous forests, wetting places, in lowland and montane zones. Hu, Mo, Pl, Ro, Sk, Uk.

**335. *Cerastium tatrae*** Borbás, *C. lerchenfeldianum* Schur — Perennial, stems 8-15 cm high, bare below, glandular-downy above. **Seeds mostly reniform, lateral compressed, marginal notch deep and tuberculate, 1.2-1.4 x 1-1.2 mm. Surface fine tuberculate, faint lustrous, reddish-brown.  $2n = 36$ .** Endemic to the High Tatras, on rocks, screes, stony ridges, moist calcite or mylonitic grounds, in subalpine and alpine zones. Pl, Ro, Sk.

**336. *Cerastium tomentosum*** L. — Perennial, up to 45 cm high, mat, white tomentose. **Seeds cuneate**

**to ellipsoidal or circular, flattish, side faces concave, marginal notch compressed, 1.5-1.8 x 1.2-1.4 mm. Surface verrucose, papillae prolonged comb-shaped, lustreless, reddish- or dark-brown.  $2n = 36, 38, 72, c. 108$ .** Native to Apennines and Sicilia; widely cultivated in rock-gardens, terraces, often escaping and naturalized.

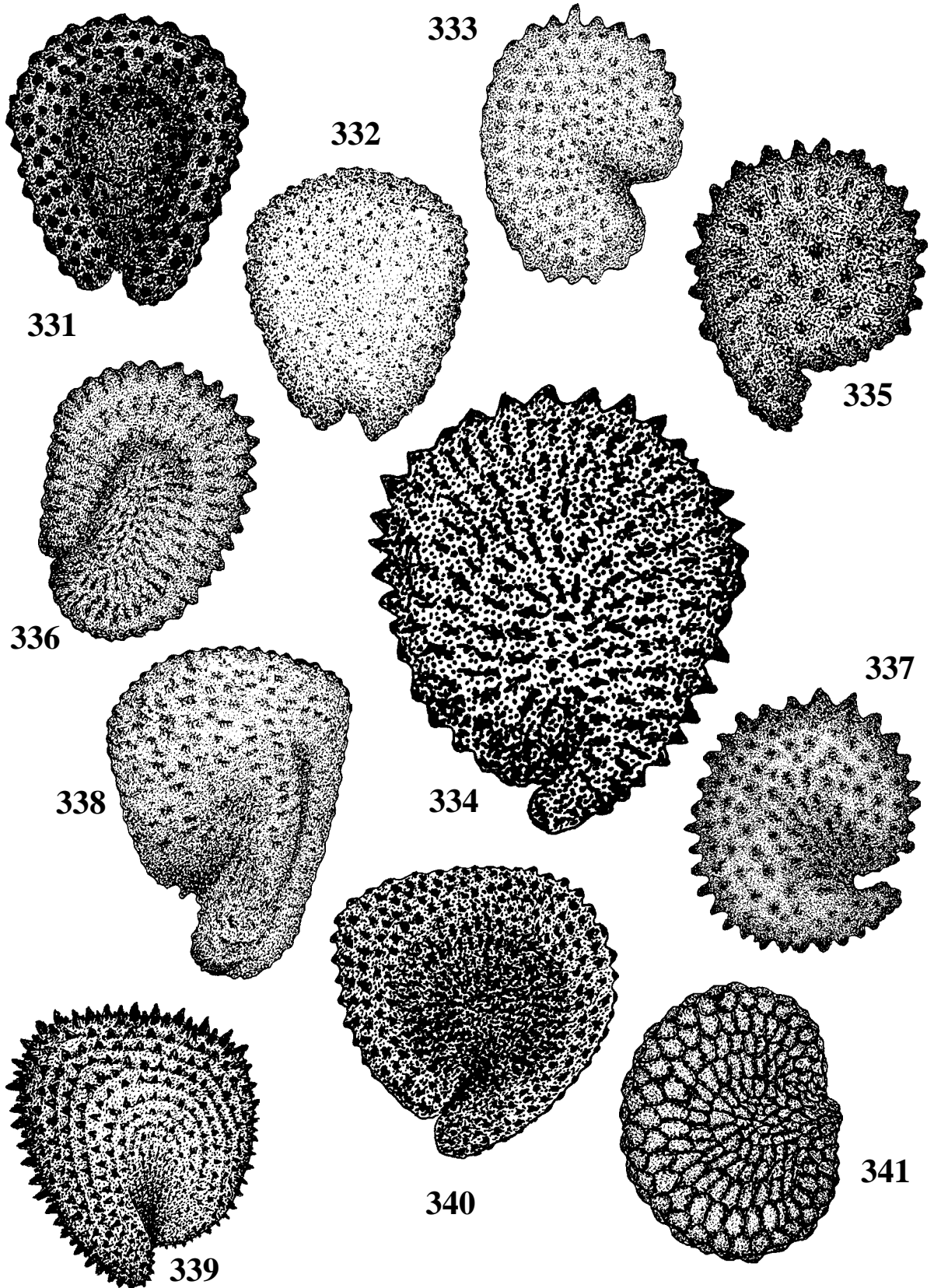
**337. *Cerastium transsylvanicum*** Schur. — Perennial, up to 40 cm high, caespitose, rich-branched at base, erect, stems glandular-pubescent and short non-flowering shoots. **Seeds circular or elliptic, flattish, side view concave, marginal notch deep, 1.2-1.6 x 1-1.2 mm. Surface acute tuberculate, slight lustrous, dark-brown.** Endemic to the eastern and southern Carpathians, in moist, shady places, in subalpine and alpine zones. Ro

**338. *Cerastium uniflorum*** Clairv. — Perennial, up to 3-10 cm high, densely tufted with many barren woolly shoots. **Seeds cuneate or reniform, flattish, side areas concave, marginal face and 1.4-2 x 1.1-1.6 mm. Surface fine tuberculate, testa loose, lustreless, yellow or pale-brown.  $2n = 36$ .** Native to the Alps and West Carpathians, on overgrown screes, moist rocks, stony alpine meadows, 1900-2300 m elevation. Pl, Sk.

**339. *Agrostemma githago*** L., *Lychnis githago* (L.) Scop — Annual, up to 30-100 cm high, stems appressed, greyish pubescent, erect. **Seeds cuneate or irregular, side faces wide convex, radicle longer than cotyledons, 3-3.8 x 2.6-3 mm. Surface covered with prominent acute tubercles, lustreless, blackish-brown to black.  $2n = 24, 48$ .** Native to southeastern Europe, naturalized as a weed in cereals, but less abundant than previously; throughout the Carpathians.

**340. *Agrostemma linicola*** Terechov — Annual, from among the previous species it is distinct by a narrower and less hairy calyx-tube. **Seeds broad cuneate or subtriangular, apex truncate-rounded, radicle longer than cotyledons, 2.6-3 x 2.6-3 mm. Surface tuberculate, papillae blunt-rounded, dull, nigrescent to black.** Native to the Ukraine, in flax fields, isolated dragging into the Carpathians and Europe. Sk, Uk.

**341. *Coronaria coriacea*** (Moench) Schischk. et Gorschk., *Agrostemma coronaria* L. — Perennial, densely pubescent plant, stems 30-50 cm high, single flowers on long stalks. **Seeds  $\pm$  ellipsoid**



or reniform, lateral slight compressed, 1-1.2 x 0.8-1 mm. Surface tuberculate, dull, dark-grey. Native to southern Europe, the Asia Minor up to the Himalayas, on wood margins, clearings, shrubberies, rarely cultivated in gardens and escapes.

**342. *Lychnis chalconica* L.** – Perennial, up to 60 cm high, stems erect, non-branched, hispid, stout. **Seeds reniform, obcordate or ellipsoid, lateral view flattish, slight biconvex, marginal face convex, 1.2-1.4 x 0.9-1.1 mm** Surface covered with papillae, margin prickly, dull, grey or greyish-brown. **2n = 24.** Originally growing in southeastern Europe, in woods and thickets; often cultivated in gardens, seldom escaping, in the whole Carpathians.

**343. *Lychnis coronaria* (L.) Desr.** – Perennial, up to 30-100 cm high, densely woolly-hirsute, stems erect and branched. **Seeds reniform or subcircular, compressed, slight slanted, side-faces, flat or slight convex, 1-1.2 x 0.9-1 mm.** Surface closely covered with papillae, dull, grey. **2n = 24.** Native to southern and eastern Europe, xerophyllous herb on stony and bushy slopes, often planted as ornamental in gardens, locally naturalized. Hu, Pl, Ro, Sk.

**344. *Lychnis flos-cuculi* L., *Coronaria flos-cuculi* (L.) A. Braun** – Perennial, up to 20-90 cm, stems ramified, sparsely scabrid-puberulent. **Seeds reniform to subcircular, compressed, slight biconvex, marginal face rounded, 0.8-1 x 0.6-0.8 mm.** Surface covered with close-spaced, stelliform papillae arranged in concentric rows, margin prickly, dull, greyish-brown to nigrescent. **2n = 24.** Native to Europe, rare of the south, common on damp meadows, marshes and fens in the mountain zone; all over the Carpathians.

**345. *Lychnis flos-jovis* (L.) Desr., *Coronaria flos-jovis* (L.) A. Braun** – Perennial, up to 20-90 cm high, stems erect, little-ramified. **Seeds reniform, slight flattish, biconvex, marginal face rounded, 1-1.2 x 0.8-1 mm.** Surface fine tuberculate, hilum rounded, deeply concave, dull, grey up to nigrescent. **2n = 24.** Native to southeastern Europe, on sunny alpine meadows, up to 1900 m; in the Carpathians often cultivated in gardens as ornamental, seldom escaping and locally naturalized.

**346. *Steris alpina* (L.) Šourková, *Lychnis alpina* L.** – Perennial, up to 15-30 cm high, caespitose, stems simple, not viscid, smooth plant with narrow leaves and pink flowers. **Seeds reniform, flattish, marginal face plane or slight concave, 0.7-0.9 x 0.8-1 mm.**

Surface fine wrinkly, margin-face made of 4 rows of tubercles, lustrous, brown. **2n = 24.** Native to northern Europe and the Alps, along the snow-border; seldom planted in rock-gardens of the Carpathians.

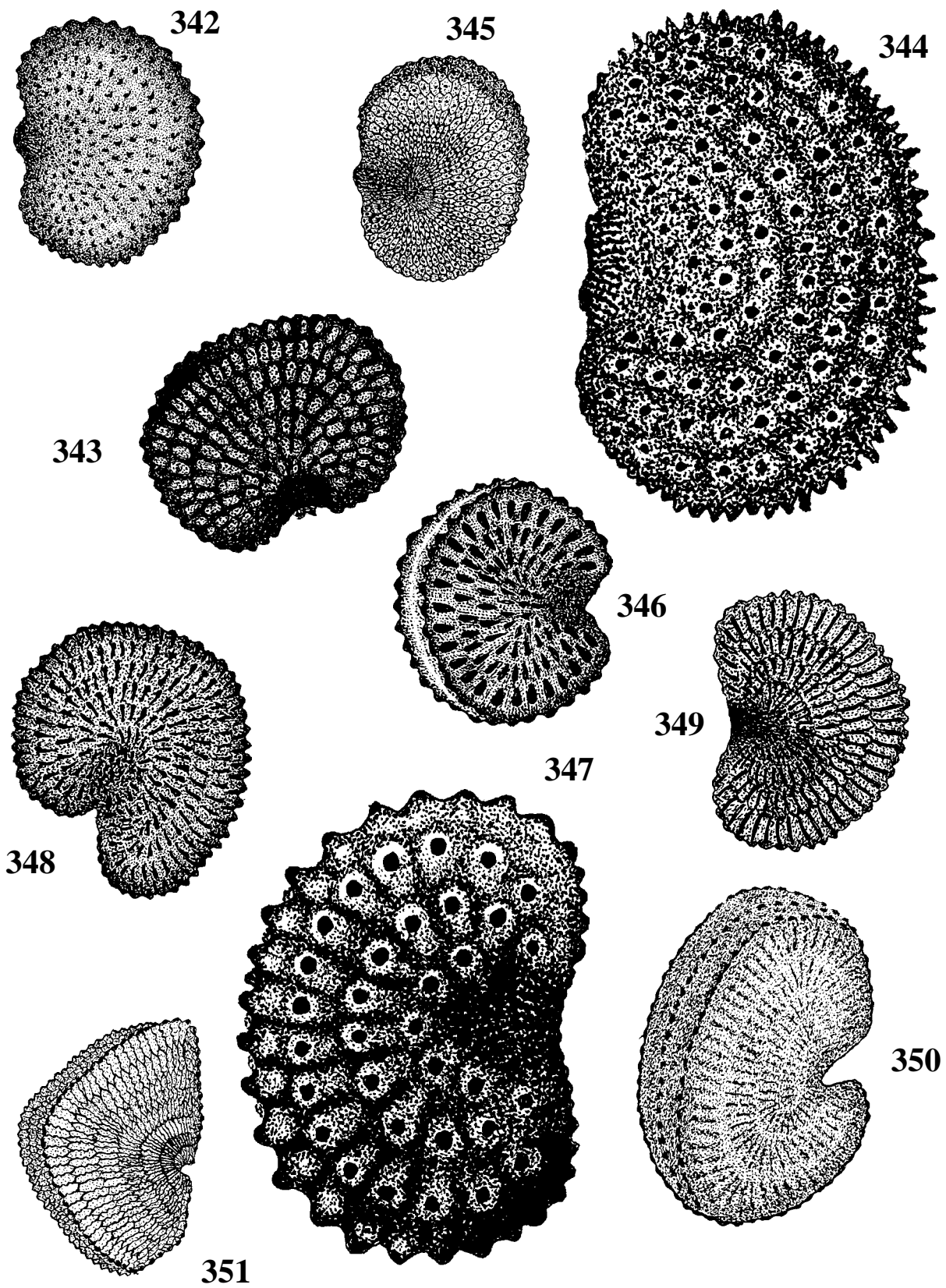
**347. *Steris viscaria* (L.) Raf., *Lychnis viscaria* L., *Viscaria vulgaris* Bernh.** – Perennial, up to 15-90 cm high, stems erect, simple or branched above, glabrous, under knots viscid. **Seeds reniform-circular, lateral view flattish, marginal face slight furrowed, 0.5-0.7 x 0.4-0.6 mm.** Surface covered with papillae in concentric rows, margin prickly, brown to dark-brown. **2n = 24.** Euro-Siberian herb, from lowland to montane zones on semi-dry turfs, heaths, meadows, woodlands and thickets; throughout the Carpathians.

**348. *Silene acaulis* (L.) Jacq., *Cucubalus acaulis* L.** – Perennial, erect flowering stems up to 2-10 cm, glabrous, erect, mat-forming. **Seeds reniform to circular, lateral view flattish, marginal face rounded or flat, sometimes concave, 1-1.4 x 1.2-1.5 mm.** Surface barely lustrous, covered with papillae arranged in concentric rows, red-brown to brown. **2n = 24.** Originally growing in the arctic zone and higher mountains of western and central Europe; often cultivated in gardens as ornamental. Pl, Ro, Sk.

**349. *Silene armeria* L.** – Annual or biennial, up to 40 cm high, stems erect, simple, smooth, viscid above, glabrous and glaucous. **Seeds reniform-circular, lateral view flattish, side-faces plane or concave, 0.5-0.6 x 0.6-0.8 mm.** Surface lustrous, with papillae in concentric rows, slight greyish, apex and papillae blackish. **2n = 24.** Native to central, southern and some parts of eastern Europe; widely cultivated in gardens and sometimes naturalized. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**350. *Silene borysthena* (Gruner) Walters, *Orites borysthena* (Gruner) Klokov** – Biennial, (rarely perennial), dioecious, stems up to 80 cm, whole plant pubescent. **Seeds reniform, lateral compressed, marginal face slightly concave, 0.6-0.8 x 0.9-1.1 mm.** Surface wrinkly, lustreless, pinkish-brown. **2n = 24.** Native to central and eastern Europe, in dry sandy places, particularly in open coniferous woods of lowlands. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**351. *Silene bupleroides* L., *S. diffusa* Willd., *S. longiflora* Ehrh.** – Perennial, up to 80 cm high, stem erect, glabrous and glaucous. **Seeds reniform to circular, flattish, marginal face concave, 1.1-1.4 x 1.7-2 mm.** Surface lustreless, covered with shallow papillae,



**dark smoke-greyish.  $2n = 24$ .** Originally growing in southern Europe, extending northwards to eastern and central Europe, on turfy, stony and overgrown slopes, in the warmest areas of the Carpathians. Hu, Mo, Ro, Sk, Uk.

**352. *Silene chloranta* (Willd.) Ehrh.** — Perennial, stems 30-80 cm high, erect, branched, glabrous, and usually glaucous. **Seeds reniform, lateral view flattish, marginal face concave, 0.8-1 x 1-1.4 mm. Surface lustreless with shallow papillae, reddish-brown.  $2n = 24$ .** Native to eastern and central Europe, on turfed slopes, sandy pine forest verges; in lowlands of the Carpathians. Br, Mo, Pl, Ro, Sk, Uk.

**353. *Silene coeli-rosa* (L.) Rchb.** — Annual, whole plant glabrous, stems 20-50 cm, leaves linear-lanceolate. **Seeds reniform, lateral compressed, lateral and marginal faces convex, 0.7-0.8 x 0.8-1 mm. Surface papilla in rows, lustreless, greyish-brown.** Native to southwestern Europe, in damp places; in the Carpathians very rarely cultivated in gardens.

**354. *Silene compacta* Fischer** — Annual or biennial, like *S. armeria*, but with stouter stems and wider leaves. **Seeds reniform, lateral flattish, marginal face slight concave, 0.6-0.7 x 0.6-0.8 mm. Surface in concentric rows distinct verrucose, lustreless, greyish-brown.** Native to the area from the Balkan Peninsula up to Asia Minor, on mountain shrubby slopes; for its nice flowers rarely cultivated in gardens and rock-gardens as ornamental. Mo, Ro.

**355. *Silene cretica* L.** — Annual, stems erect, 20-60 cm high, branched, downy below, bare above, base leaves ovoid-shovel, stem leaves oblanceolate, fruit roundish inflated. **Seeds reniform, lateral compressed with a broad depressed back on the dorsal side, 1.3-1.5 x 1.6-1.8 mm. Surface aculeate, lustreless, reddish-brown.** Native to the eastern Mediterranean; hauling rarely into the Carpathians in flax fields.

**356. *Silene dichotoma* Ehrh.** — Annual, up to 30-100 cm high, downy scattered bristly plant, stems erect, branched above. **Seeds reniform to circular, slight flattish, marginal face slight concave, 1-1.2 x 1.4-1.6 mm. Surface lustreless, covered with distinct papillae in concentric rows, dark-brown, papillae almost black.  $2n = 24$ .** Native to eastern and southeastern Europe, as weed in fields, fallows and

waste grounds in warmer areas; widely naturalized, in the whole Carpathians.

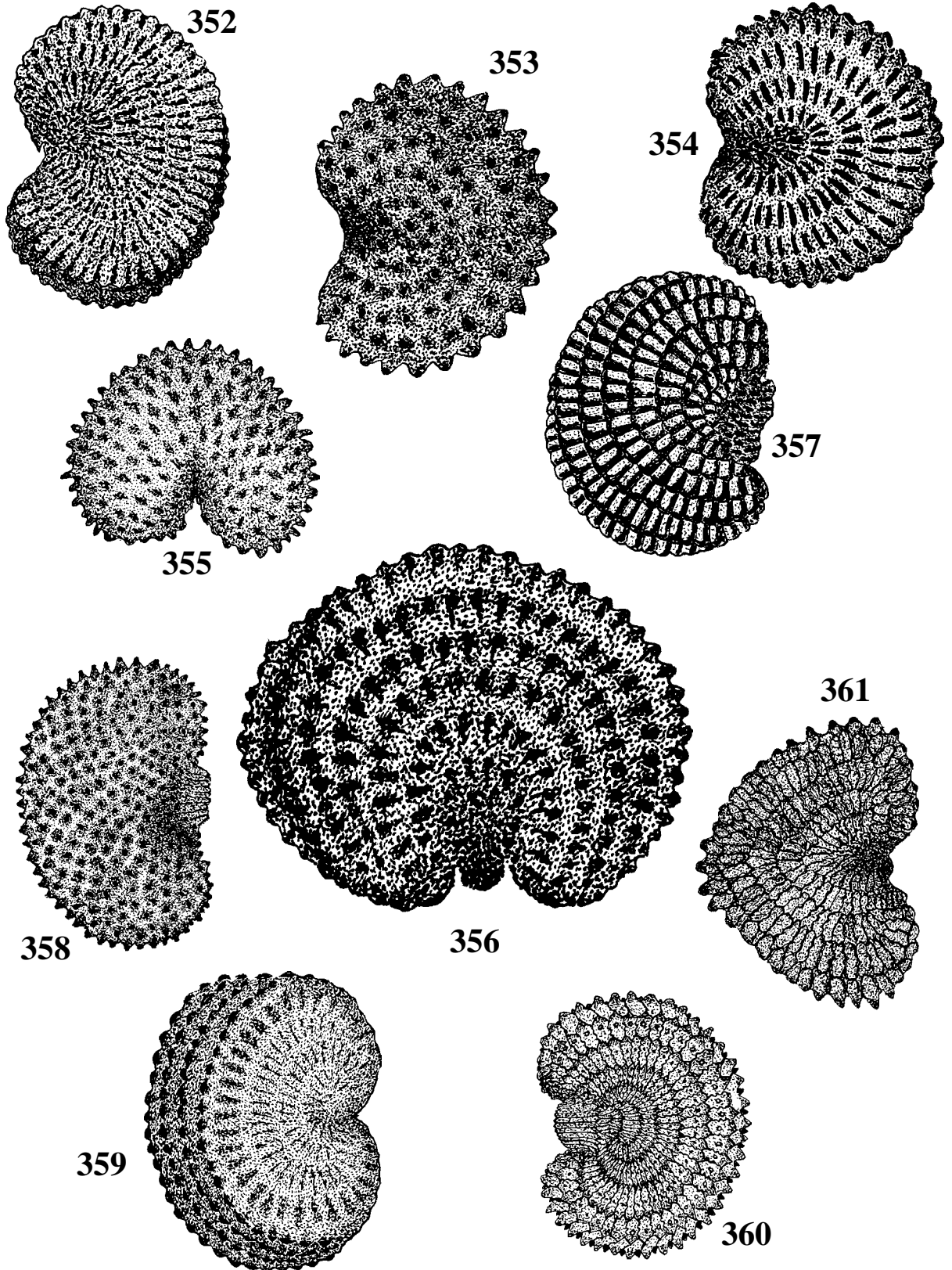
**357. *Silene dinarica* Spreng., *S. depressa* Baumg.** — Perennial, up to 5-8 cm high, caespitose, stems erect, slender, more or less pubescent. **Seeds reniform to semiglobular, ventral side truncate, marginal faces rounded side faces convex, hilum round, concave, 1.4-1.6 x 1.8-2 mm. Surface dull, verrucose, papillae in concentric rows, greyish.** Native to the South Carpathians (endemic to Romania), on stony calcareous screes of the alpine zone. Ro.

**358. *Silene dioica* (L.) Clairv., *Melandrium dioicum* (L.) Simonk., *M. rubrum* Garcke** — Perennial, up to 60-100 cm high, stem downy, soft-hairy, glandular, flowers red. **Seeds circular to reniform, slight flattish, side and marginal face convex, hilum ascendent, circular, 0.9-1.1 x 1.4-1.6 mm. Surface dense verrucose, dull, dark-grey.  $2n = 24$ .** Native to Eurasia, in damp lowland forests, coastal thickets, wet and mountain meadows, locally abundant in woodlands. Br, Hu, Pl, Ro, Sk, Uk.

**359. *Silene donetzica* Kleopov, *S. densiflora* D'Urv., *Otites donetzica* (Kleopov) Klokov** — Biennial, up to 180 cm high, robust herb, in lower 1/3 densely leaved, pubescent, very viscid, stems erect. **Seeds reniform, lateral view flattish, marginal face plane, wide, 0.6-0.8 x 0.8-1 mm. Surface lustreless, papillae with a black apex, grey.  $2n = 24$ .** East-Carpathian endemic, on sandy open places, thickets, steppes. Sk, Uk.

**360. *Silene dubia* Herbach, *S. transsilvanica* Schur, *S. nutans* var. *dubia* Zapał.** — Perennial, stems 20-40 cm high, leaves glabrescent, weakly ciliate, inflorescence unilateral. **Seeds reniform or circular, lateral compressed, 1.1-1.2 x 1.3-1.5 mm. Surface dense verrucose, dull, brown.** Native to the Carpathians mountains, from the montane up to the alpine zones (800-2500 m), on stony stands. Pl, Ro, Sk, Uk.

**361. *Silene flavesces* Waldst. et Kit.** — Perennial, stems up to 30 cm, stiff, erect, shortly pubescent below, viscid above. **Seeds reniform, lateral compressed, marginal face concave, 0.7-0.9 x 0.9-1.1 mm. Surface wrinkly in concentric rows, marginal face concave, lustreless, pinkish-brown.  $2n = 24$ .** Native to the mountains of the Balkan Peninsula and the South Carpathians, on grassy slopes and screes, in montane and subalpine zones. Hu, Ro.





**362. *Silene gallica* L., *S. anglica* L.** – Annual to biennial, up to 15-45 cm high, stems erect, simple or branched, pubescent, viscid above. **Seeds reniform, side faces deep concave, marginal face with two mighty ramparts, hilum round, concave, 0.7-0.9 x 0.9-1.1 mm. Surface with prolonged papillae, metallic lustrous, dark greyish-brown to nigrescent. 2n = 24.** Native to southern and central Europe, now cosmopolitan, in fields, scrubs, mainly in light soils. Hu, Pl, Ro, Sk, Uk.

**363. *Silene heuffelii* Soó, *Melandrium nemorale* Heuff. ex Rchb.** – Annual or biennial, stems 30-40 cm high, branched from the base, dispersely or densely tomentose. **Seeds reniform, lateral slight compressed, marginal face convex, hilum rounded, 1-1.2 x 1.2-1.4 mm. Surface covered with papillae, lustreless, bluish-grey.** Native to the Balkan Peninsula and the East Carpathians, on shrubby slopes in montane and subalpine zones. Ro.

**364. *Silene hypanica* Klokov** – Annual, biennial or perennial, cymose, inflorescence densely corymbose, stems 25-100 cm high, branched above. **Seeds reniform to nearly spherical or cordate, lateral compressed, marginal face concave, 0.6-0.7 x 0.7-0.8 mm. Surface concentrate wrinkly, lustreless, greyish-brown.** Native to southeastern Europe, rarely on granitic and steppe habitats. Uk.

**365. *Silene italica* L., *S. livida* Grec.** – Perennial, up to 40-80 cm high, stems erect, glandular-pubescent below. **Seeds reniform to ellipsoid, lateral faces concave, marginal face flat or convex, hilum circular, concave, 1-1.2 x 1.2-1.4 mm. Surface verrucose, papillae in concentric rows, dull, grey. 2n = 24.** Native to southeastern Europe up to Asia Minor, on grassy slopes, shrubberies, diluted forests; in the Carpathians rarely naturalized. Ro, Uk.

**366. *Silene latifolia* Poir., *Lychnis alba* Mill., *Melandrium album* (Mill.) Garcke** – Perennial, seldom annual, up to 80 cm high, densely pubescent, stems ramified, often glandular-hirsute above. **Seeds reniform to circular, side faces slight convex, marginal face convex, 0.8-1.1 x 1.2-1.6 mm. Surface lustreless, covered with papillae in concentric rows, grey or dark-brown. 2n = 24.** Native to Eurasia, frequent as field weed, on dryer meadows, thickets, boundaries, waste places, cultivated grounds from lowlands up to the uplands; all over the Carpathians.

**367. *Silene linicola* C. C. Gmelin** – Annual, whole plant scabrid-puberulent, stems erect, slender, with deflexed scales or hairs, simple below, branched above. **Seeds reniform, lateral flattish and concave, marginal face concave, 1.5-1.7 x 1.9-2.1 mm. Surface of faces deep excavate, ridged-striate, slight concave, lustreless, reddish-grey. 2n = 24.** Native to the Mediterranean, as weed in flax-fields; rarely hauling into the Carpathians.

**368. *Silene lithuanica* Zapał.** – Annual, biennial, stems 20-50 cm high, leaves lanceolate, 10-20 mm long, inflorescences fascicled. **Seeds ellipsoidal or reniform, laterally compressed, ridge flat or slight concave, 0.5-0.6 x 0.6-0.7 mm. Surface wrinkly, faintly lustrous, brown.** Native to Europe, in light pine woods and margins, sandbanks. Pl, Ro, Uk.

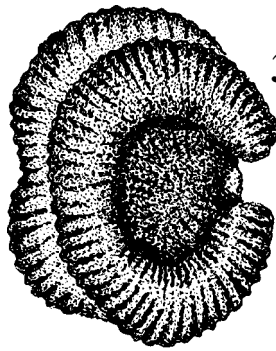
**369. *Silene multiflora* (Ehrh.) Pers., *Cucubalus multiflorus* Ehrh.** – Perennial, up to 30-60 cm high, stem erect, unbranched, rough with crisped hairs or glabrous. **Seeds reniform, on side faces smooth or slight humped, margin wave, 0.6-0.8 x 0.8-1 mm. Surface rich papillate, lustreless, reddish-brown to black. 2n = 24.** Native to eastern and central Europe, seldom on wet meadows, saline pastures and steppes of warmer lowlands. Hu, Mo, Ro, Sk, Uk.

**370. *Silene muscipula* L., *S. arvensis* Loscos non Salisb.** – Annual, stems 15-40 cm high, usually simple below, erect, glabrous, rather rigid. **Seeds reniform, lateral compressed, faces plane, 0.9-1.1 x 1.1-1.3 mm. Surface striate, tuberculate at the edge, back narrow, obtuse grooved, lustreless, grey or reddish-grey.** Native to the Mediterranean; transiently hauling into warmer areas of the Carpathians.

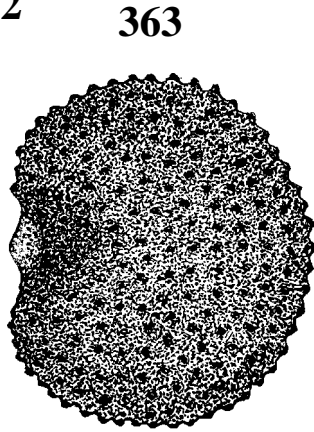
**371. *Silene nemoralis* Waldst. et Kit.** – Biennial, stems single, 100-120 cm high, with a rather dense many-flowered panicle. **Seeds reniform, lateral and marginal faces plane, hilum circular, concave, 0.8-1 x 1-1.2 mm. Surface, concentric rows crested, lustreless, grey. 2n = 24.** Native to central Europe and mountains of southern Europe, in light woods, on calcite rocks. Hu, Mo, Pl, Ro, Sk, Uk.

**372. *Silene noctiflora* L., *Melandrium noctiflorum* (L.) Fries** – Annual, up to 10-40 cm high, stems erect, rough at base, simple or with basal branches, glandular-pubescent above. **Seeds circular-reniform, slight flattish, biconvex, marginal face convex, hilum round, deep concave, 1.1-1.4 x 1.3-1.6 mm. Surface dense tuberculate, lustreless, dark-greyish**

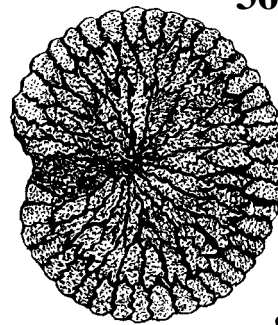




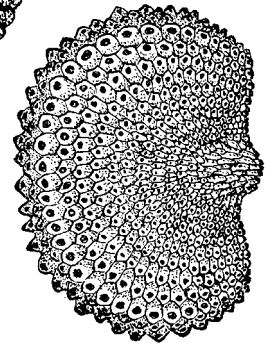
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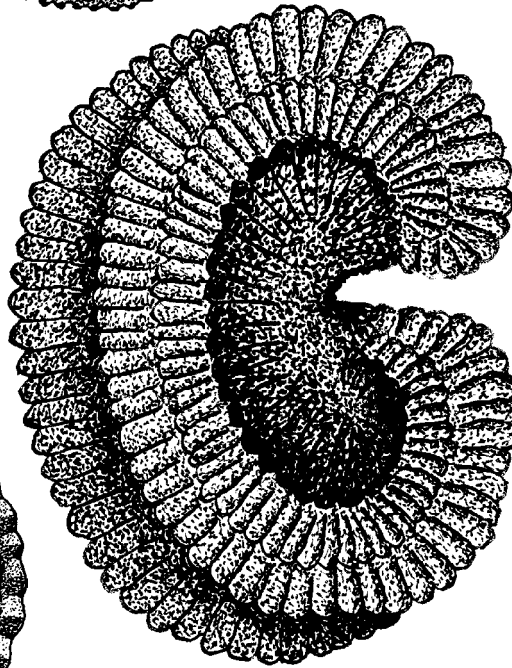
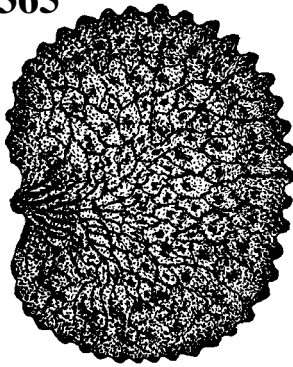


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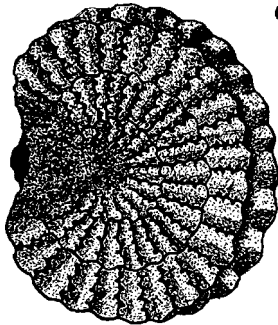


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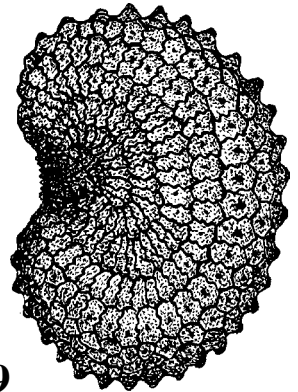
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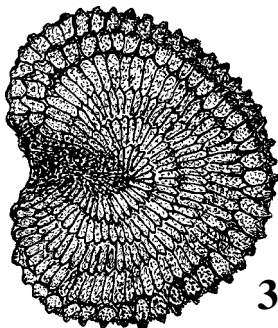
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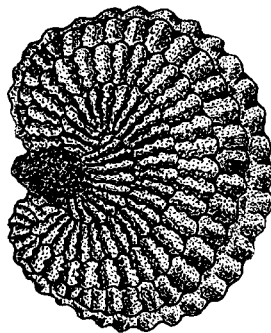
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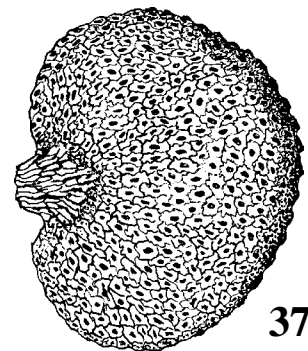
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to greyish-brown.  $2n = 24$ . Native to Eurasia, from lowland to subalpine zones, widespread as weed of cultivated fields and forest margins. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**373. *Silene nocturna* L.** — Annual, stems 10-60 cm high, erect, usually branched, flowers 5-15 in raceme-like cymes, densely crowded above. **Seeds reniform, faces excavate-articulate, back wide, with a shallow, tuberculate groove, 0.8-1 x 0.7-0.8 mm. Surface wrinkly, lustreless, pinkish-grey.** Native to the Mediterranean region; rarely hauling temporarily into the warmer areas of the Carpathians.

**374. *Silene nutans* L.** — Perennial, stems 20 to 60 cm high, usually unbranched, long pubescent below, the rest dispersely downy or smooth. **Seeds reniform up to circular, flattish, side faces concave to convex, rarely flat, 0.8-1 x 1.1-1.4 mm. Surface lustreless, covered with conical papillae, margin prickly, intense grey-coloured, papillae black.  $2n = 24$ .** Throughout Europe, except the extreme north, from lowland to submontane zones, on semi-dry turf, heaths, woodlands, rocky debris, usually calcicole; throughout the Carpathians.

**375. *Silene otites* (L.) Wibel, *Otites cuneifolia* Raf., *Cucubalus otites* L.** — Biennial, up to 60 cm high, inflorescence very ramified. **Seeds reniform, lateral compressed, both sides and marginal face concave, 0.6-0.7 x 0.7-0.8 mm. Surface wrinkly, lustreless, dark-brown.  $2n = 24$ .** Native to Eurasia, on stony slopes, pastures; widespread in all Carpathian territories.

**376. *Silene otites* subsp. *hungarica* Wrigley, *Otites pseudotites* auct. non (Besser. ex Rchb.) Klokov** — Biennial, up to 60 cm high, stems erect, inflorescences very ramified. **Seeds reniform-circular, lateral view flattish, side faces plane or concave, margin sharp angled against the side faces, 0.7-0.8 x 0.9-1.1 mm. Surface lustreless, lacking papillae, red-brown to henna.  $2n = 24$ .** Widespread in eastern, southern and central Europe, on rocks, stony and sandy places of warmer area. Hu, Pl, Ro, Sk.

**377. *Silene pendula* L.** — Annual, pubescent, up to 10-40 cm high, stems procumbent-ascending, branched. **Seeds subglobose, side faces convex or planoconvex, marginal face convex, hilum rounded, concave, 0.9-1.1 x 1-1.3 mm. Surface with concentric rings of small tubercles, lustreless, greyish.  $2n = 24$ .** Originally growing in the

Mediterranean region, widely introduced elsewhere; cultivated in gardens as ornamental and sometimes naturalized. Ro, Sk, Uk.

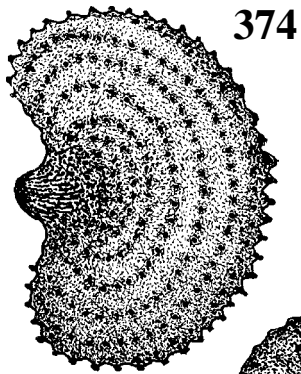
**378. *Silene procumbens* Murray** — Perennial, stems up to 30 cm long, procumbent, branched, scabrid puberulent. **Seeds reniform, lateral compressed, side face tuberculate, ridged in concentric rows, marginal face convex, 1.3-1.5 x 1.7-1.9 mm. Surface wrinkly, slight lustrous, reddish-grey to grey.** Native to eastern Europe, on overflowed meadows, riverbanks, alluvial sands. Uk.

**379. *Silene rupestris* L.** — Perennial, up to 10-25 cm high, caespitose, stems erect, branched below, smooth. **Seeds reniform-circular, flattish, side faces slight slanted, plane or concave, 0.4-0.6 x 0.6-0.8 mm. Surface lustreless, in concentric rows, nigrescent to black.  $2n = 24$ .** Native to the mountains of northern, western and central Europe; in the Carpathians growing only in Romania in dry, stony, chalky soils, mainly screes. Ro.

**380. *Silene saxifraga* L., *S. petraea* Waldst. et Kit., *Petrosilene saxifragum* Four.** — Perennial, up to 10-25 cm high, usually dwarf, caespitose, stems slender, numerous, ramified, pubescent below, viscid above. **Seeds reniform, lateral view flattish, marginal face slight concave or plane, 0.8-1 x 1.1-1.3 mm. Surface wrinkly with irregular dispersed papillae, lustreless, greyish-brown.  $2n = 24$ .** Native to southern Europe, in subalpine and montane zones; extending northwards to the southwest Carpathians, on steppe rocks and screes. Mo, Ro.

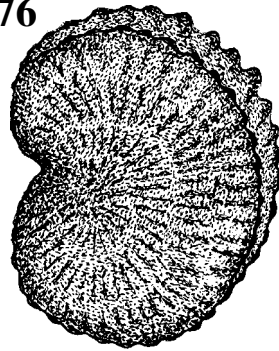
**381. *Silene scabriflora* Brot.** — Perennial, stems 5-35 cm high, whole plant often densely villous, pubescent or subglabrous in part, branched, ascending or erect. **Seeds reniform, faces plane, ridged, back wide, plane or concave, 0.7-0.9 x 0.8-1 mm. Surface tuberculate in concentric rows, lustreless, reddish-grey to grey.  $2n = 24$ .** Native to southwestern Europe; rarely and transiently hauling into the Carpathians.

**382. *Silene schafta* Gmel.** — Perennial, up to 20 cm high, sparsely caespitose, with large pinkish-red flowers in the lax panicle, leaves hard and lustrous. **Seeds reniform, lateral compressed, 0.9-1.1 x 1.2-1.4 mm. Surface dense aculeate, dentate at margins, lustreless, greyish-brown.** Native to high mountains of the Caucasus (up to 3500 m and higher); in the Carpathians cultivated in rock-gardens as attractive species.

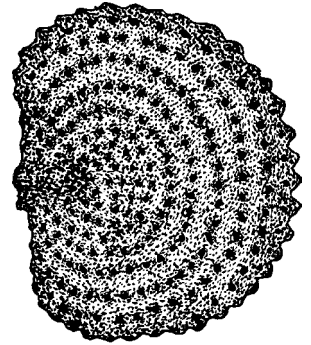
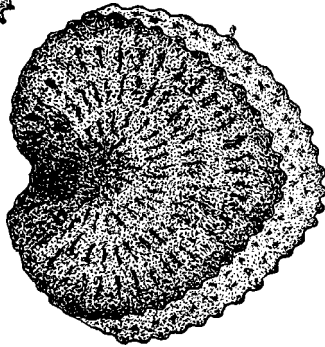


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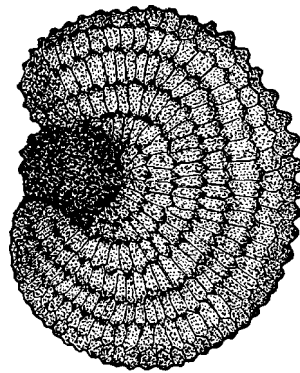
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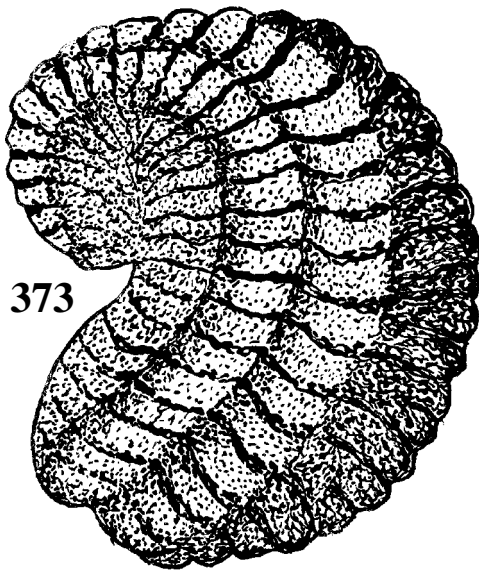
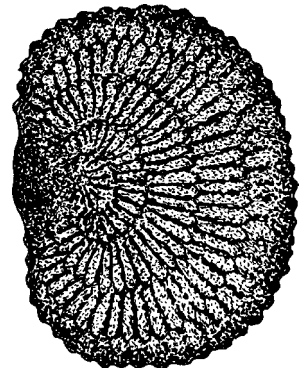


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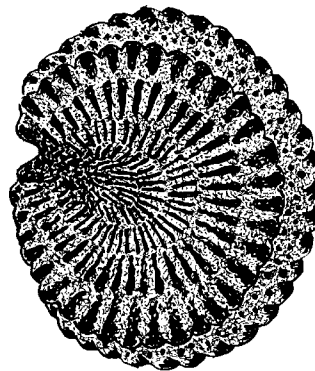


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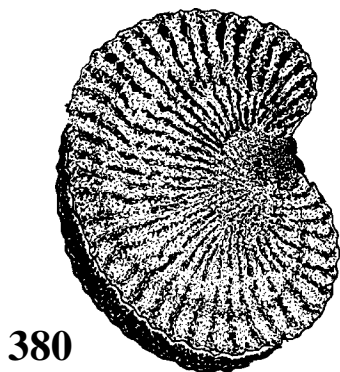
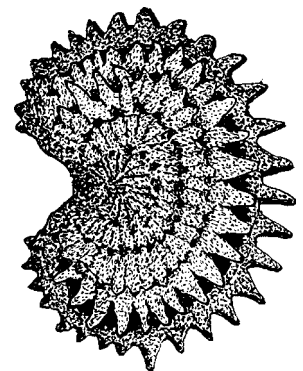


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**383. *Silene sibirica* (L.) Pers.** — Perennial, monoeious, stems up to 40-60 cm high, subglabrous. **Seeds reniform, side faces plane, marginal face concave, 0.5-0.6 x 0.6-0.8 mm. Surface papillate in concentric rows, dull, reddish-brown.** Native to south-eastern Europe, on steppes, calcareous slopes, rare. Mo, Ro, Uk.

**384. *Silene supina* M. Bieb.** — Perennial, stems procumbent, much branched from a woody stock, more or less scabrid-puberulent. **Seeds reniform, dorsal side convex, ventral side plane, marginal face plane or slight convex, 0.9-1 x 1.2-1.4 mm. Surface papillate on the dorsal side and smooth on the ventral side, lustreless, reddish-brown. 2n = 24.** Native to southeastern Europe, on stony slopes, sands, rare. Mo, Ro, Uk.

**385. *Silene tatarica* (L.) Pers.** — Perennial, stems erect, 25-60 cm high, simple or barely branched, glandular above, loosely hairy below. **Seeds reniform to circular, lateral view flattish, side faces plane or concave, marginal face concave, 0.7-0.9 x 0.7-1.1 mm. Surface barely lustrous, covered with minute papillae, red-brown. 2n = 24.** Northeastern Euro-Siberia, on riverbanks, sandy dunes, roadsides, shrubberies, forest margins. Br, Mo, Pl, Ro, Uk.

**386. *Silene thymifolia* Sibth. et Sm., *S. pontica* Brandza** — Perennial, stems procumbent, many-branched from a woody stock, scabrid puberulent. **Seeds reniform, side faces plane or slight convex, marginal face slight concave or plane, 1.1-1.3 x 1.4-1.6 mm. Surface crested in concentric rows, dull, slight reddish-brown. 2n = 48.** Native to the western coast of the Black Sea, on maritime sands. Ro.

**387. *Silene trinervia* Sebast. et Mauri** — Annual, stems erect, 20-60 cm, light pubescent, usually divaricately branched. **Seeds reniform, lateral compressed, side and marginal faces plane or slight convex, 0.7-0.8 x 0.8-1 mm. Surface tuberculate ridged, margin wide with 4 rows of low rounded tubercles.** Native to the Balkan Peninsula, on roadsides, sandy soils. Ro.

**388. *Silene viridiflora* L.** — Perennial, up to 40-90 cm high, robust, stems erect, unbranched. **Seeds reniform, lateral view flattish, marginal face slight concave or convex, 1-1.2 x 1.1-1.5 mm. Surface dense tuberculate in concentric rows, lustreless, greyish. 2n = 24.** Native to southern Europe, extending northwards to central and eastern Europe up to Siberia and

eastern Asia, in deciduous forests and thickets, alpine meadows. Hu, Mo, Ro, Sk, Uk.

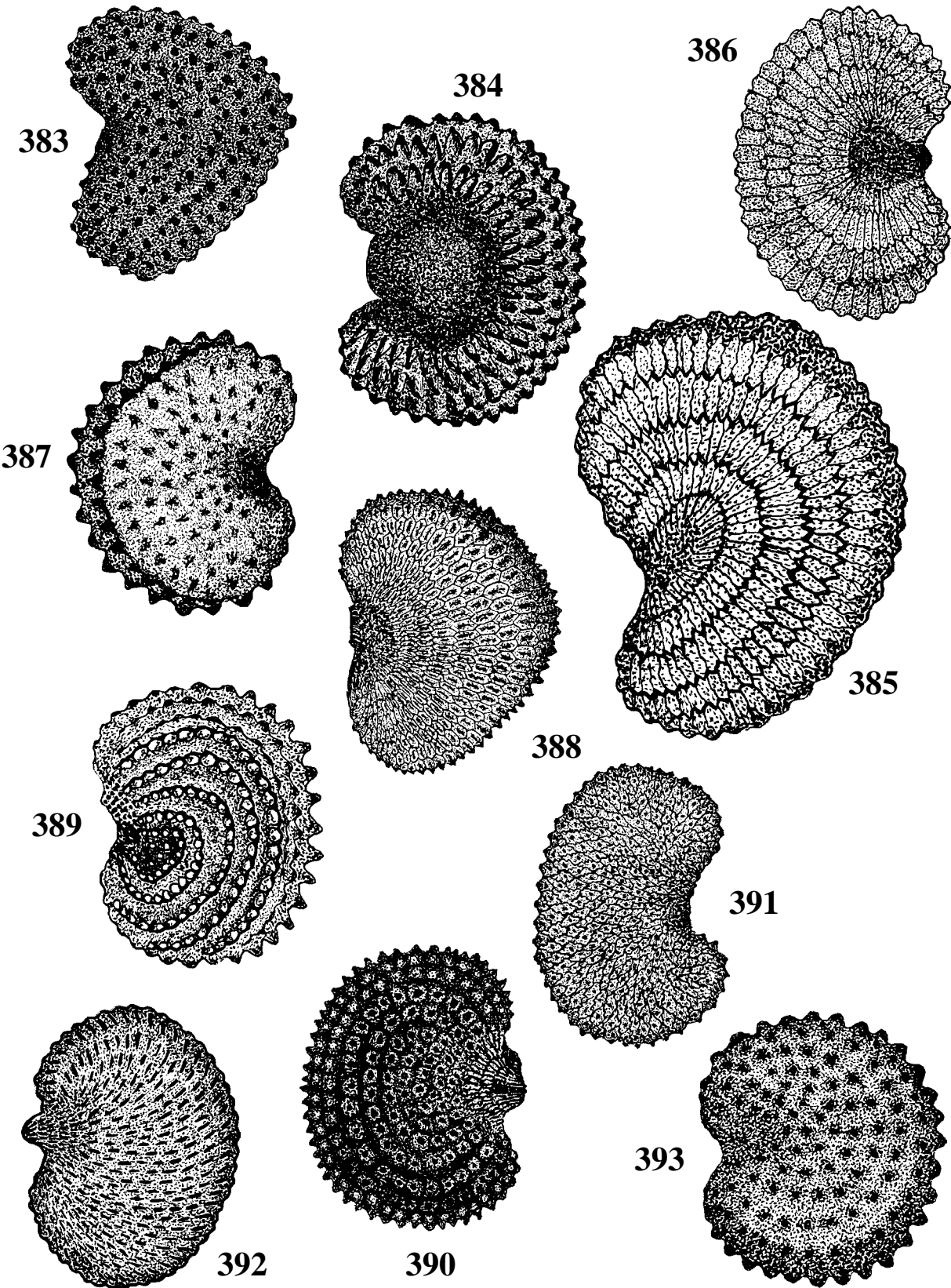
**389. *Silene viscosa* (L.) Pers., *Cucubalus viscosus* L., *Melandrium viscosum* (L.) Čelak.** — Biennial, up to 30-70 cm high, stems erect, robust, unbranched, glandular-tomentose, whole plant viscid, **Seeds reniform to circular, side faces plane or slight convex, 0.8-0.9 x 0.9-1.1 mm. Surface lustreless, verrucose, papillae conical in concentric rows, greyish-brown. 2n = 24.** Native to Eurasia, overgrown pastures, in sandy soils, forest steppes, rarely in lowlands and hills. Hu, Mo, Ro, Sk, Uk.

**390. *Silene vulgaris* (Moench) Garcke, *S. inflata* Sm., *S. cucubalus* Wibel** — Perennial, laxly caespitose, stems up to 80 cm high, bare, rarely downy, branchy, leaves ovoid to lanceolate. **Seeds reniform, lateral flattish, 1.1-1.3 x 1.4-1.6 mm. Surface verrucose, faint lustrous, grey or greyish-brown. 2n = 24.** Native to Eurasia, on dry meadows, pastures, boundaries, light woods, embankments, shrubberies. Br, Pl, Ro, Sk, Uk.

**391. *Silene wolgensis* (Willd.) Besser ex Sprengel** — Biennial, often 100 cm or more, with very diffuse panicle of small white flowers. **Seeds reniform, lateral compressed, side faces plane or slight concave, margin wide and plane, 0.9-1.1 x 1.4-1.6 mm. Surface wrinkly with small papillae, lustreless, grey. 2n = 24.** Native to southeastern Europe, on steppes, stony slopes, saline soils. Br, Mo, Ro, Uk.

**392. *Silene zawadskii* Herb., *Melandrium zawadskii* (Herb.) A. Br.** — Perennial, up to 15-30 cm high, stems ascendent, pubescent, simple, unifloral. **Seeds reniform to circular, side faces slight concave, marginal face convex, hilum circular or oval, deeply concave, 1.3-1.5 x 1.7-1.9 mm. Surface dense verrucose, dull, grey to greyish-brown.** Native in eastern Carpathians, endemic, on calcareous, stony grounds of subalpine and alpine zones. Ro, Uk.

**393. *Pleconax conica* (L.) Šourková, *Silene conica* L.** — Annual, up to 10-50 cm high, glandular-downy herb, stems erect. **Seeds reniform-circular, lateral view flattish, side faces plane, marginal face shallow concave, 0.7-0.8 x 0.7-0.8 mm. Surface barely lustrous, papillae stelliform, greyish-brown. 2n = 20, 24.** Native to central and southern Europe, mostly on sandbanks, in sandy fields and stony places, in warmer areas. Hu, Mo, Pl, Mo, Ro, Sk.



**394. *Ixoca pusilla*** (Waldst. et Kit.) Soják, *Heliosperma carpaticum* (Zapał.) Klokov, *Silene pusilla* Waldst. et Kit. — Perennial, up to 5-20 cm high, loosely turfed, smooth, stems slender, ascendent, branched. **Seeds reniform to circular, flattish, from crest-shaped margin increase numerous excresces of pale-brown colour, 1-1.2 x 1.2-1.4 mm. Surface tuberculate in concentric rows, dark-brown. 2n = 24.** Native to southern and central Europe, on mountain rocks, stream-sides, rarely below 500 m elevation. Pl, Ro, Sk, Uk.

**395. *Petrorhagia illyrica*** (L.) P. W. Ball et Heywood, *Tunica illyrica* (L.) Fischer et C. A. Meyer — Perennial, stems numerous, stiff, up to 30 cm high, glandular, dichotomic ramified. **Seeds shield-formed, often irregular with an extended tip of radicle, compressed, ventral side hollow-concave 1.2-1.5 x 0.8-1.1 mm. Surface striate, dull, black-brown.** Native to the Balkan Peninsula, rarely on rocky splits, slopes and stony roadsides. Ro.

**396. *Petrorhagia prolifera*** (L.) P. W. Ball et Heywood, *Dianthus profler* L., *Kohlrauschia prolifera* (L.) Kunth — Annual, stem slender, 20-50 cm high, glabrous or scabrid-pubescent. **Seeds shield-shaped, similar to those of *P. saxifraga*, with a broaden marginal brim, in outline obovoid, 1.2-1.4 x 0.8-0.9 mm. Surface striate, black-brown. 2n = 30.** Native to central Europe and mountains of southern Europe, in dry stony or sandy places, rocks, stone-pits in warmer areas; throughout the Carpathians.

**397. *Petrorhagia saxifraga*** (L.) Link, *Tunica saxifraga* (L.) Scop. — Perennial, up to 10-40 cm high, caespitose, stems ascendent, slender downy below. **Seeds shield-formed through squeezing often irregular with an extended tip of radicle, compressed, ventral side hollow-concave, 0.7-0.8 x 1.4-1.6 mm. Surface striate dull, black-brown to black. 2n = 30, 60.** Central and southern Europe, in sandy, stony places and on rocks. Hu, Mo, Pl, Ro, Sk, Uk.

**398. *Gypsophila acutifolia*** Steven ex Spreng. — Perennial, up to 20-150 cm high, robust, stems erect, branched, glabrous below, glandular above. **Seeds reniform to circular, lateral view planoconvex or biconvex, 1.1-1.3 x 1.3-1.5 mm. Surface with distinct, very close spaced papillae in concentric rows, with graphite coloured tint.** Place of origin western Asia and southeastern Europe, sometimes hauling into central and western Europe; often culti-

vated in gardens as a permanent plant, rarely naturalized. Hu, Ro, Sk, Uk.

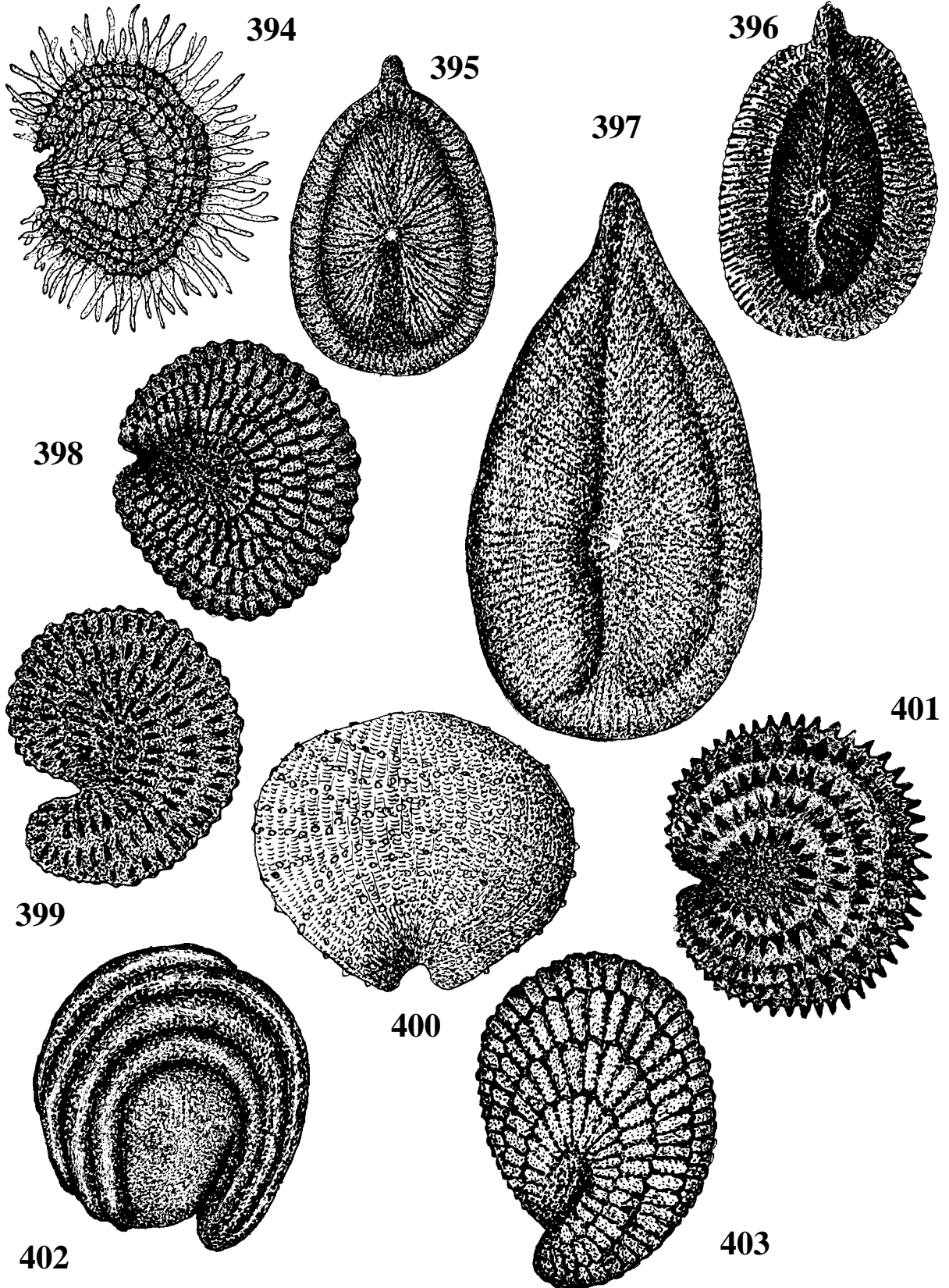
**399. *Gypsophila altissima*** L., *G. oligosperma* A. Krasnova — Perennial, up to 30 cm high, stems numerous, erect, strong, branched and glandular-pubescent above, glabrous below. **Seeds reniform to subglobular, slight compressed, side faces planoconvex, marginal face convex, 1-1.2 x 1.2-1.4 mm. Surface verrucose, papillae in concentric rows, dull, greyish-brown to nigrescent.** Native to southeastern Europe, central Asia, on gypsum grounds; rarely cultivated in gardens. Pl, Mo, Ro, Uk.

**400. *Gypsophila elegans*** M. Bieb. — Annual, up to 20-50 cm high, glabrous, branched above. **Seeds cuneate or reniform, lateral view planoconvex or concavo-convex, marginal face convex, 1.3-1.5 x 1.5-1.9 mm. Surface with distinct obtuse papillae in concentric rows, black. 2n = 34.** Native to Asia Minor and the Ukraine, on stony slopes, gravelly river terraces; cultivated elsewhere as ornamental and naturalized in a few places.

**401. *Gypsophila fastigiata*** L., *G. ucrainica* Kleopov — Perennial, up to 20-100 cm high, robust, stems erect, branched, glabrous below, glandular-pubescent above. **Seeds reniform to circular, lateral view flattish, marginal face convex, 1.2-1.4 x 1.1-1.2 mm. Surface covered with indistinct serrulate papillae arranged in rows, black-brown to black. 2n = 34.** Mainly in eastern and central Europe, on sandbanks, sandy pine forests in warmer areas. Br, Hu, Pl, Ro, Sk, Uk.

**402. *Gypsophila glomerata*** Pall. ex M. Bieb., *G. globulosa* Steven ex Boiss — Perennial, up to 100 cm high, stems erect, cylindrical, ramified above, glabrous or puberulent below inflorescence. **Seeds reniform to globular, flattish, side faces and margin convex, 1.1-1.3 x 1-1.2 mm. Surface with long, acute, conical tubercles, lustreless, greyish-brown.** Native in southeastern Europe, on stony steep slopes of the hills. Mo, Ro, Uk.

**403. *Gypsophila muralis*** L., *Psammophiliella muralis* (L.) Ikonn. — Annual, up to 20-40 cm high, stems erect, strongly dichotomic-ramified at base, glabrous above, sparsely puberulent below. **Seeds cuneate, slight flattish, biconvex, marginal face convex, 0.4-0.5 x 0.3-0.4 mm. Surface lustreless with very small papillae in rows, black. 2n = 34.** Native to Eurasia, in weedy fields, along woodlands,





paths, on muddy riverbanks, calcifugous. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**404. *Gypsophila paniculata* L.** — Perennial, up to 35-90 cm high, glabrous or pubescent below, with many erect stems, branched above. **Seeds reniform to circular, lateral view slight flattish, biconvex, marginal face convex, 1-1.2 x 1-1.5 mm. Surface with distinct close spaced conical papillae in rows, black-brown to black.  $2n = 34$ .** Eurasian and western Siberian herb. In the Carpathians mostly on blown sands, in sandy and stony places, forest margins; cultivated as ornamental and sometimes naturalized. Br, Hu, Mo, Pl, Ro, Sk.

**405. *Gypsophila perfoliata* L.** — Perennial, stems 30-100 cm high, ascending at base, glandular-pubescent below, glabrous above, yellow-green. **Seeds reniform, circular, lateral view flattish, side and marginal faces convex, 1.1-1.3 x 1.2-1.4 mm. Surface with distinct close spaced small papillae, nigrescent to black.** Native to eastern Europe, dragging into the Carpathians, in saline soils, on steppes, slopes, cultivated lands. Ro, Sk, Uk.

**406. *Gypsophila petraea* (Baumg.) Rchb., *G. transsilvanica* Spreng.** — Perennial, up to 5-20 cm high, bushy, stemlets erect, rounded, simple, puberulent above. **Seeds horseshoe-formed to reniform, side faces flattish, marginal face prickly in two rows, 1.4-1.6 x 1.3-1.5 mm. Surface lowly tuberculate in 2-3 rows, slight lustrous, dark-brown.  $2n = 34$ .** Native to the East and South Carpathians, in rocky and stony localities, subalpine and alpine zones, calcicole. Ro.

**407. *Gypsophila repens* L.** — Perennial, up to 8-30 cm high, glabrous, with numerous, ascendent, reddish, much branched stems. **Seeds reniform-circular, flattish, side faces planoconvex, marginal face convex, 1.2-1.4 x 1.5-1.9 mm. Surface with acute, conical tubercles in rows, dull, dark-brown to black.  $2n = 34$ .** Native to central West Carpathians and southwestern Europe mountains, on moist wastes, rocks, stony banks, calcicole. Hu, Pl, Ro, Sk.

**408. *Gypsophila scorzonrifolia* Ser.** — Perennial, up to 50-60 cm high, stems ascending at base, glandular-pubescent above, glabrous below, ramified. **Seeds reniform to subglobular, slight compressed, side faces planoconvex, marginal face convex, 1-1.1 x 1.2-1.4 mm. Surface verrucose, papillae small in concentric rows, dull, greyish-brown.** Native to

southeastern Europe, on sandy maritime dunes, wet saline and sandy grounds; hauling into central Europe. Ro, Uk.

**409. *Cucubalus baccifer* L.** — Perennial, up to 150 cm high, with procumbent or trailing stems, divaricate branched, fragile. **Seeds ellipsoid, with expressive structure, 1.3-1.5 x 1.6-1.8 mm. Surface glossy, slight wrinkly, dark-purple to black.  $2n = 24$ .** Native in central and southern Eurasia, common on dry grassy land, moist roadsides, shrubberies near riverbanks, temporary overflowed places; throughout the Carpathians.

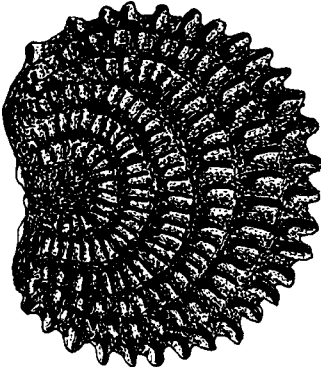
**410. *Vaccaria hispanica* (Mill.) Raushert, *Saponaria hispanica* Mill., *Vaccaria segetalis* Garcke** — Annual, up to 30-60 cm high, stems erect, branched above, glabrous. **Seeds subglobose with longitudinal, broad suture from the top to hilum on the ventral side, 1.9-2.4 x 1.9-2.4 mm. Surface rough, slight lustrous or dull, waved, black.  $2n = 30$ .** Originally growing in central and southern Europe, usually a weed of cultivated fields; throughout the Carpathians.

**411. *Saponaria bellidifolia* Sm.** — Perennial, up to 30-40 cm high, caespitose, glabrous, stems erect, unbranched. **Seeds ellipsoid to globular, side faces planoconvex, marginal face convex, hilum rounded, 1.9-2.1 x 1.4-1.6 mm. Surface dense verrucose, dull or barely lustrous, dark-brown to nigrescent.  $2n = 28$ .** Native to southern Europe, in stony and rocky localities, on calcareous grounds. Ro.

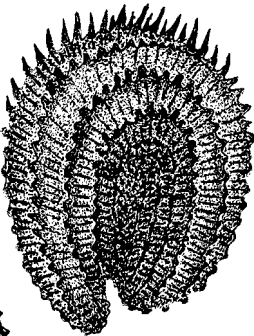
**412. *Saponaria glutinosa* M. Bieb.** — Annual or biennial, up to 25-50 cm, robust, stems erect, branched above, glandular-hirsute. **Seeds subglobular, compressed, marginal face convex, hilum oval, concave, 1.9-2.1 x 1.8-2 mm. Surface dense verrucose, dull, dark-brown to nigrescent.  $2n = 56$ .** Native to southeastern Europe, Asia Minor, in stony and rocky places, open dry slopes, light forests, denude places. Ro, Uk.

**413. *Saponaria ocymoides* L.** — Perennial, up to 10-20 cm high, stems at base procumbent or ascendent, branched, pilose. **Seeds reniform to subglobular, slight flattish, side and marginal faces convex, hilum rounded, white, 1.5-1.7 x 1.7-2.1 mm. Surface dense warty, dull, brown to dark-brown.  $2n = 28$ .** Native to southwestern and central Europe, on sandy and stony grounds of uplands; in the Carpathians cultivated in rock-gardens, occasionally escaping and naturalized.

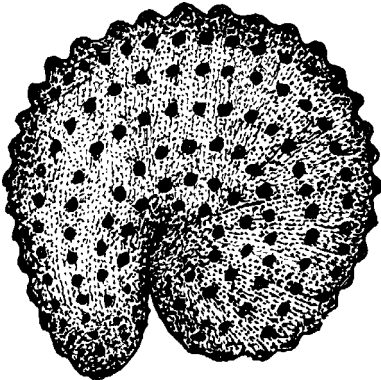




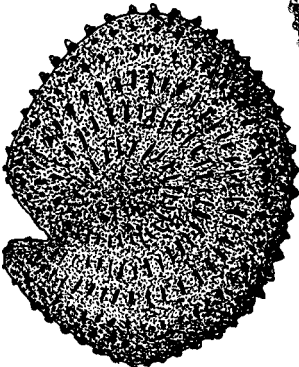
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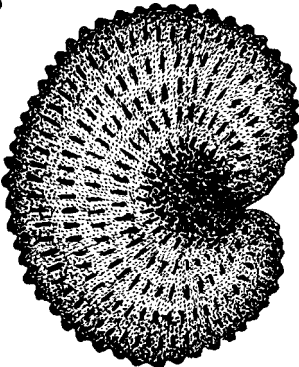
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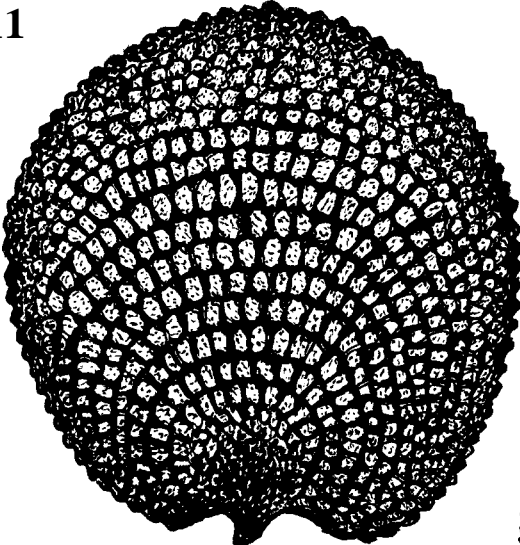


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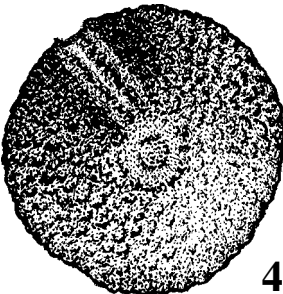
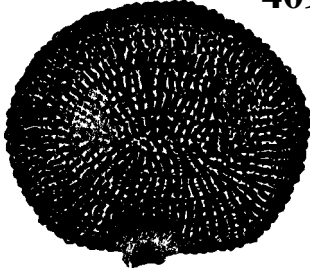
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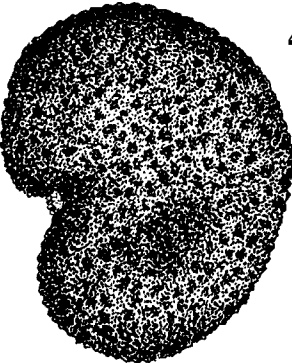
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**414. *Saponaria officinalis* L.** — Perennial, up to 30-90 cm high, mostly smooth, glandular only on the upper part, stems simple or branched above. **Seeds reniform to circular, compressed, side and marginal faces convex, 1.3-1.8 x 1.3-2.1 mm. Surface bare lustrous, covered with papillae in rows, blackish-brown to black.  $2n = 28$ .** European and western Siberian species; in throughout the Carpathians, mostly in lowlands and uplands, in woodlands and shrubberies, river and brook flooded plains.

**415. *Saponaria pumila* (St. Lager) Janchen, *Silene pumila* St. Lager** — Perennial, stems short having one flower, small shrubby formed, leaves linear with rough margins. **Seeds roundish or  $\pm$  reniform, lateral compressed, 1.6-1.8 x 1.4-1.6 mm. Surface reticulate-foveate, faint lustrous, brownish-black to black.** Native to the Alps, on mountain grassy places, very rarely at 2-3 localities in Romania. Ro.

**416. *Saponaria pumilio* (L.) Fenzl ex A. Braun** — Caespitose, stems very short, often shorter than the solitary terminal flower. **Seeds  $\pm$  spherical or reniform, lateral slight compressed, marginal face convex, 1.8-2 x 1.8-2 mm. Surface dense covered with small papillae, slight lustrous, reddish-black to black.** Native to the Alps and Carpathians, on mountain pastures, calcifuge. Ro.

**417. *Dianthus andrzejewskianus* (Zapał.) Kulcz.** — Perennial, 30-70 cm high, glaucous. **Seeds shield-formed, compressed, dorsal side convex, ventral concave with a hilum in the middle, apex with beak, bottom rounded, 2.2-2.6 x 1.4-1.7 mm. Surface wrinkly allover, opaque or slight lustrous, blackish.** Native to southeastern Europe, on steppes, rocks, dry meadows, stony slopes. Mo, Uk.

**418. *Dianthus arenarius* L.** — Perennial, up to 10-40 cm high, stems slender, simple or branched, with 1-6 pairs of leaves. **Seeds shield-formed, dorsoventral compressed, dorsal face convex, margin not revolute, middle ridge  $\pm$  distinct, 1.9-2.3 x 1.3-1.9 mm. Surface netted, opaque or slight lustrous, black-brown to black.  $2n = 60$ .** Central and eastern Europe, in sandy soils of pine forests and waste lands. Br, Pl.

**419. *Dianthus armeria* L.** — Annual, or biennial, usually pubescent, with erect, branched, 30-40 cm high stems, petal-limb reddish, dentate, bearded. **Seeds shield-formed, compressed, dorsal face slight convex, ventral face hollow-concave with revolute**

**margin, with a strong marked ridge, 1-1.5 x 0.7-0.9 mm. Surface dorsal and ventral closely wrinkly allover, black-brown to black.  $2n = 30$ .** Native to most of Europe, but rare in the north, in sunny thicket slopes, stony and sandy pastures, forest borders, vineyards. Br, Cz, Hu, Mo, Pl, Ro, Sk, Uk.

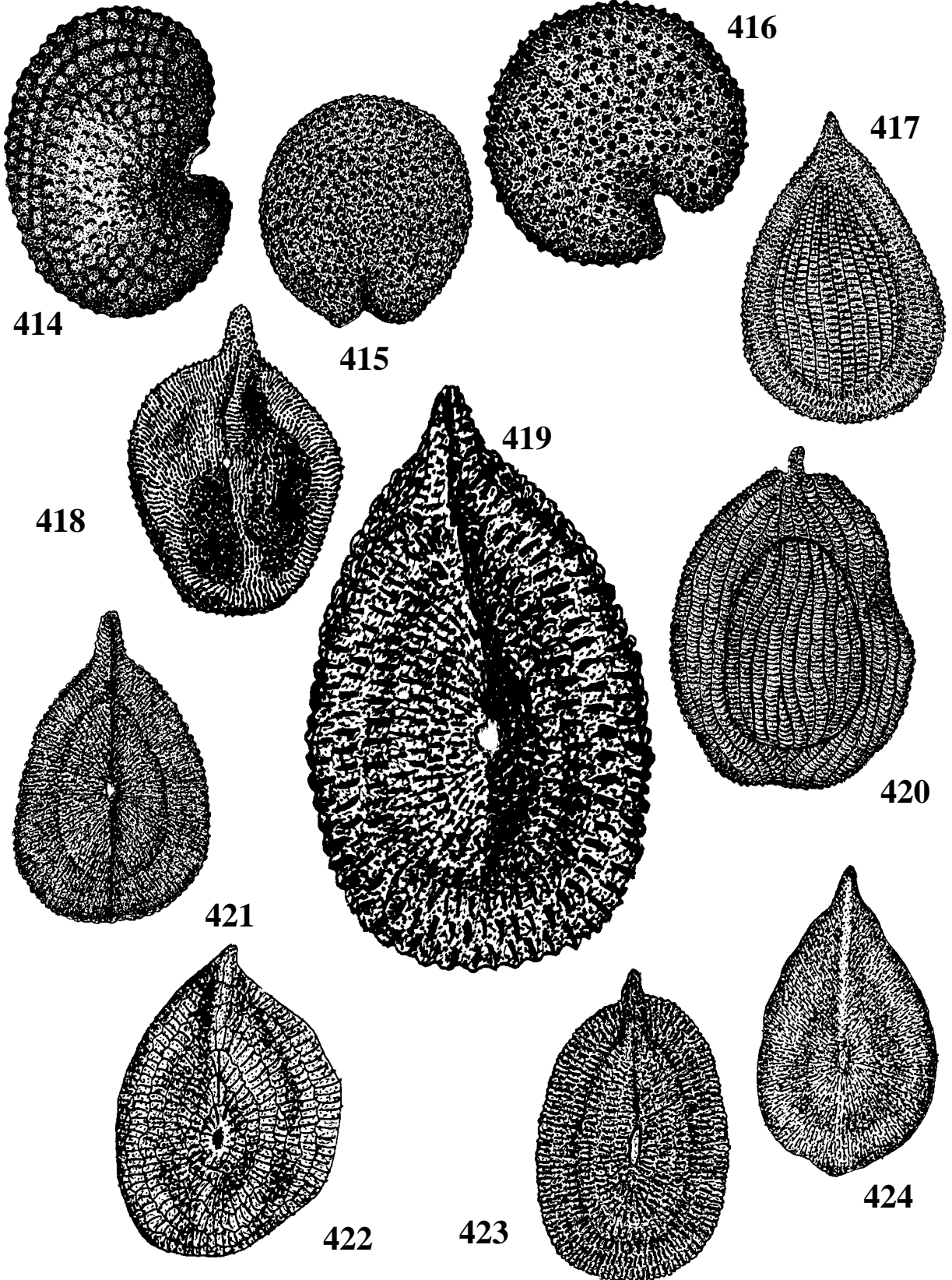
**420. *Dianthus banaticus* (Heuff.) Borbás** — Perennial, up to 25-60 cm high, stems slender, scabrid above. **Seeds broad ellipsoid, shield-formed, dorsal face slight convex with longitudinal arranged papillae, ventral face concave with beam-arranged papillae, ridge mostly indistinct, 2.9-3.3 x 2.1-2.3 mm.** Native to the South-West Carpathians, on meadows and grassy places, rarely. Ro.

**421. *Dianthus barbatus* L.** — Perennial, up to 60 cm high, subglabrous, stems erect, unbranched, coarse. **Seeds shield-formed, compressed, transverse section mainly irregular T-formed, dorsal face slight biconvex, ventral face almost plane, its margin not or slightly revolute, without or with a middle-ridge, 2-2.6 x 1.4-1.8 mm. Surface wrinkly allover, black-brown to black.  $2n = 30$ .** Originally growing in southern Europe, on mountain meadows and pastures; cultivated in gardens, elsewhere, locally naturalized. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**422. *Dianthus borbásii* Vandas** — Perennial, with an unbranched woody stock from which flowering stems and short leafy shoots arise. **Seeds irregular-globose, shield-shaped, compressed, dorsal side slight convex, ventral concave, longitudinal ridge with a hilum in the middle, 1.7-2 x 1.3-1.5 mm. Surface dense wrinkly in rows, dull, blackish.** Native to eastern Europe, on sands in pine-woods, forest-steppes, sporadical. Br, Mo, Pl, Uk.

**423. *Dianthus callizonus* Schott et Kotschy** — Perennial, stems glabrous with one flower, rarely 2-5 flowers, 10-20 cm high, unbranched, flowers carmine. **Seeds obovoid, shield-formed, compressed on bottom, cuneate formed, 2.8-3.6 x 1.8-2 mm. Surface fine wrinkly, dull or slight lustrous, black.  $2n = 30$ .** Native to the Romanian mountains, endemic, in stony, grassy localities. Ro.

**424. *Dianthus campestris* M. Bieb.** — Perennial, usually puberulent with a stout stock tufted, with short, densely leaved stems, 20-40 cm high. **Seeds shield-formed, cuneate in the bottom part, compressed, with a non-expressive ridge, 1.8-2.2 x 1.2-1.3 mm. Surface beamy wrinkly,**



**blackish-brown to black.  $2n = 30$ .** Native to south-eastern Europe, rare on calcareous, dry slopes, sandy places, pine woods and forest clearings. Mo, Ro, Uk.

**425. *Dianthus capitatus*** Balbis ex DC. — Perennial, up to 70 cm high, glaucous, flowers bearded to almost glabrous, purple. **Seeds shield-formed, irregular ellipsoid and undulated, with a slight revolute margin, longitudinal ridge with hilum in the middle, 1.8-2.2 x 1.2-1.5 mm. Surface fine wrinkly, dull, black.** Native to southeastern Europe, rare in localities scattered; around the Black Sea on grassy and stony slopes. Mo, Ro, Uk.

**426. *Dianthus carthusianorum*** L., *Tunica carthusianorum* (L.) Scop. — Perennial, up to 20-60 cm high, glabrous, with smooth, closely branched stems. **Seeds shield-formed, irregular circular, compressed, its margin not revolute, or only slight, ridge usually strong marked, 2-2.4 x 1.5-1.8 mm. Surface fine wrinkly allover, blackish-brown to black.  $2n = 30$ .** Originally growing in central Europe, mainly in the Carpathians, in upland, mountain and subalpine zones, on dry and semidry turf, meadows, pastures, boundaries. Cz, Hu, Mo, Pl, Ro, Sk, Uk.

**427. *Dianthus caryophyllus*** L. — Perennial, up to 20-80 cm high, laxly caespitose, stems ascendent above, usually glaucous, poorly branched. **Seeds shield-formed, compressed, dorsal view slight convex, ventral plane or concave, 2.8-3.3 x 1.8-2.2 mm. Surface wrinkly-striate, blackish-brown to brown.** Native to southwestern Europe; in the Carpathians widely cultivated in flowerpots in many cultivars for ornament.

**428. *Dianthus chinensis*** L. — Annual to biennial, up to 20-40 cm high, stems erect, glabrous. **Seeds shield-shaped, compressed, dorsal side slight convex, ventral plane or concave, 2.5-3.1 x 1.7-2.1 mm. Surface wrinkly in circular rows, blackish- or reddish-brown.  $2n = 60$ .** Originally growing in eastern Asia; cultivated in many full-blossom cvs, in gardens as a summer plant, transiently rarely naturalized.

**429. *Dianthus collinus*** Waldst. et Kit., *D. seguieri* Vill. subsp. *collinus* (Waldst. et Kit.) Hegi — Perennial, up to 20-80 cm high, erect, shortly pubescent or glabrous, unbranched. **Seeds shield-shaped, cuneate compressed at ground, dorsal view convex, ventral concave with a distinct middle ridge, 2.3-2.7 x 1.7-1.9 mm. Surface wrinkly,**

**reddish- or blackish-brown.  $2n = 90$ .** Native to eastcentral Europe, extending from Romania to Yugoslavia, on sunny thicket slopes. Hu, Pl, Ro, Sk, Uk.

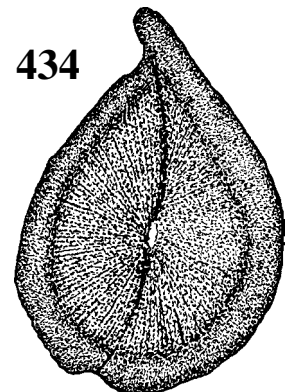
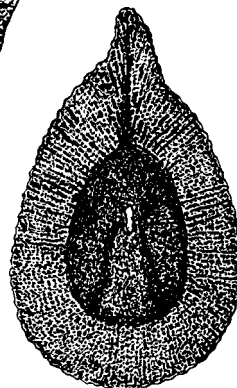
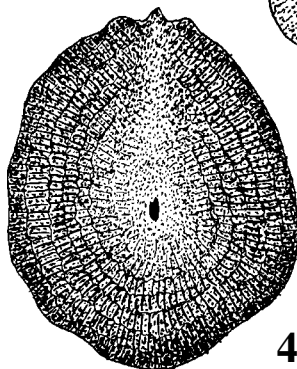
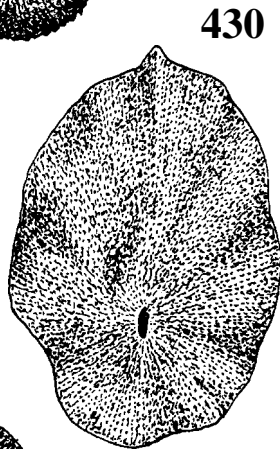
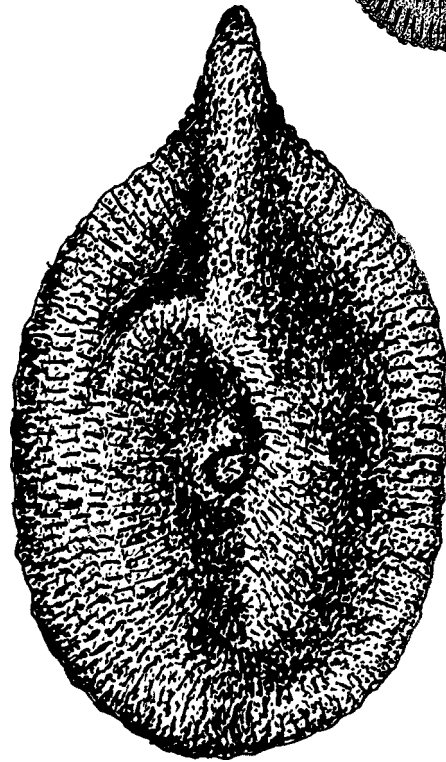
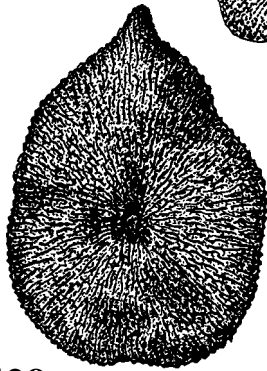
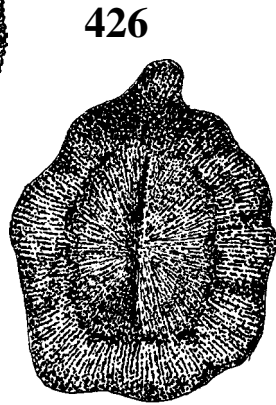
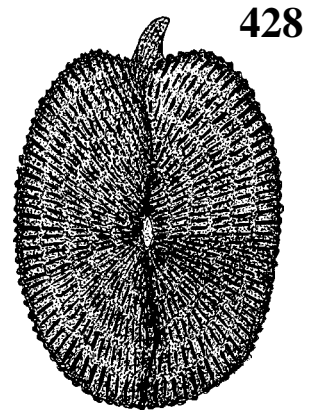
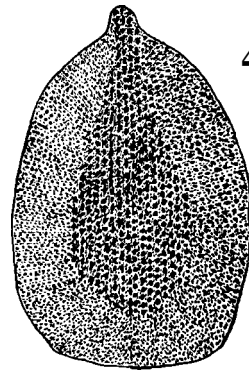
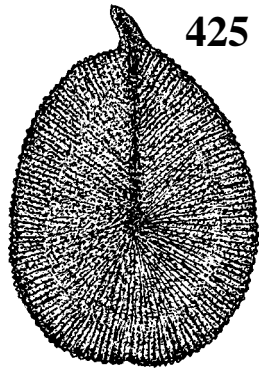
**430. *Dianthus compactus*** Kit. — Perennial, up to 45 cm high, glabrous, shortly hirsute above. **Seeds ellipsoid, shield-formed, compressed, dorsal face convex, ventral mostly planoconvex or concave, middle ridge distinct, 2.8-3.2 x 2.1-2.4 mm. Surface longitudinal or beamy wrinkly, dull, brownish-black.  $2n = 30$ .** Native to the Alps, Balkan and Carpathians, in grassy and stony localities in montane and subalpine zones, alpine meadows, forest margins. Pl, Ro, Uk.

**431. *Dianthus deltoides*** L. — Perennial, up to 20-40 cm high, tufted with short, densely leaved stems. **Seeds shield-formed, compressed, dorsal face slight convex, ventral concave with revolute margins, ridge usually strong, 1.1-1.6 x 0.7-1 mm. Surface wrinkly, mostly in longitudinal rows, blackish-brown to black.  $2n = 30, 60$ .** Most of Europe, rare in the Mediterranean region, on dry and poor pastures, meadows, light forests, boundaries, non-calcareous areas; throughout the Carpathians.

**432. *Dianthus diutinus*** Kit. — Perennial, stems up to 50 cm high, basal leaves setaceous, linear, obtuse or subobtuse, 2 or more flowers in a dense head, petal-limb dentate, pinkish-lilac. **Seeds  $\pm$  obovoid, concavo-convex, compressed, 2-2.3 x 1.2-1.4 mm. Surface sinuate wrinkly, lustreless, blackish to black.** Native to the Pannonian lowland. Hu, Ro.

**433. *Dianthus fischeri*** Sprengel — Perennial, stems 20-60 cm high, leaves tapering from just above the base. **Seeds shield-formed, strong compressed, dorsal side convex, ventral concave, mostly with indistinct ridge and a hilum, 2-2.5 x 1.7-1.8 mm. Surface dense wrinkly, lustreless, rusty-blackish.** Native to southeastern Europe, on forest margins and open slopes. Uk.

**434. *Dianthus giganteiformis*** Borbás — Perennial, up to 70 cm high, caespitose, stems robust. **Seeds shield-formed, cuneate, compressed at ground, dorsal view convex, ventral concave with a distinct ridge, 2.4-2.8 x 1.8-2 mm. Surface beamy wrinkly, black.  $2n = 30$ .** Native to southeastern Europe, from northern to southern Slovakia, on steppe uplands, sandy and stony pastures. Hu, Ro, Sk.



**435. *Dianthus giganteus*** D'Urv. — Perennial, up to 30-100 cm high, robust, stems blunt below, rounded above, often pruinose, glabrous. **Seeds obovoid to ellipsoid, compressed, dorsal side mostly convex, ventral planoconvex, hilum in the middle, 2.8-3.2 x 1.8-2 mm. Surface longitudinally and beamy wrinkly, dull, brownish-black to black. 2n = 30.** Native to Balkan, on forest margins, clearings, rocky hills, sandbanks, in montane zone. Ro.

**436. *Dianthus glabriusculus*** (Kit.) Borbás, *D. collinus* Waldst. et Kit. subsp. *glabriusculus* (Kit.) Thaisz. — Perennial, up to 30-70 cm high, leaves shortly ciliate at the margin. **Seeds shield-formed, compressed, dorsal view slight convex, ventral concave, margin revolute in the middle, longitudinal ridge with a hilum, 2.5-3.2 x 1.7-2 mm. Surface distinct wrinkly, lustreless, black. 2n = 90.** Eastern Europe element extending as far as eastern Poland, on dry grassy, stony and thicket slopes. Pl, Ro, Uk.

**437. *Dianthus glacialis*** Haenke — Perennial, caespitose, with many sterile shoots, blossomy stems up to 10 cm. **Seeds shield-formed to cuneate, compressed, dorsal face slight convex, ventral plane or concave, with a distinct, longitudinal ridge and a hilum, 1.5-1.8 x 0.9-1.1 mm. Surface beamy wrinkly, the border blackish, the centre reddish-brown. 2n = 30.** Alpine-Carpathians species, spreading from the subalpine to the subnivale zones, on rocky slits, wastes and stony plains, rare. Pl, Ro, Sk.

**438. *Dianthus gratianopolitanus*** Vill., *D. caesius* Sm. — Perennial, scarcely tufted, glabrous, sterile shoots leafy, blossomy stems with 1-2 flowers, erect, 10-20 cm high. **Seeds oval, shield-formed, compressed, dorsal face slight convex, ventral concave with a distinct ridge, 2.7-3.1 x 1.8-2.2 mm. Surface indistinct beamy, wrinkly, blackish-brown to black. 2n = (60) 90.** Native to the western and central Europe, on rocks and screes; cultivated in flowerpots, seldom in beds. Pl, Uk.

**439. *Dianthus henteri*** Heuff. — Perennial, up to 15-30 cm high, stems glabrous, caespitose. **Seeds obovoid, ellipsoid to triangular, dorsal side convex, ventral concave with a distinct ridge and a hilum, 1.8-2.2 x 1.4-1.6 mm. Surface of the dorsal side longitudinal, ventral beamy arranged wrinkly.** Native to the South Carpathians, on stony habitats, in damp, grassy places, alpine zones, rare. Ro.

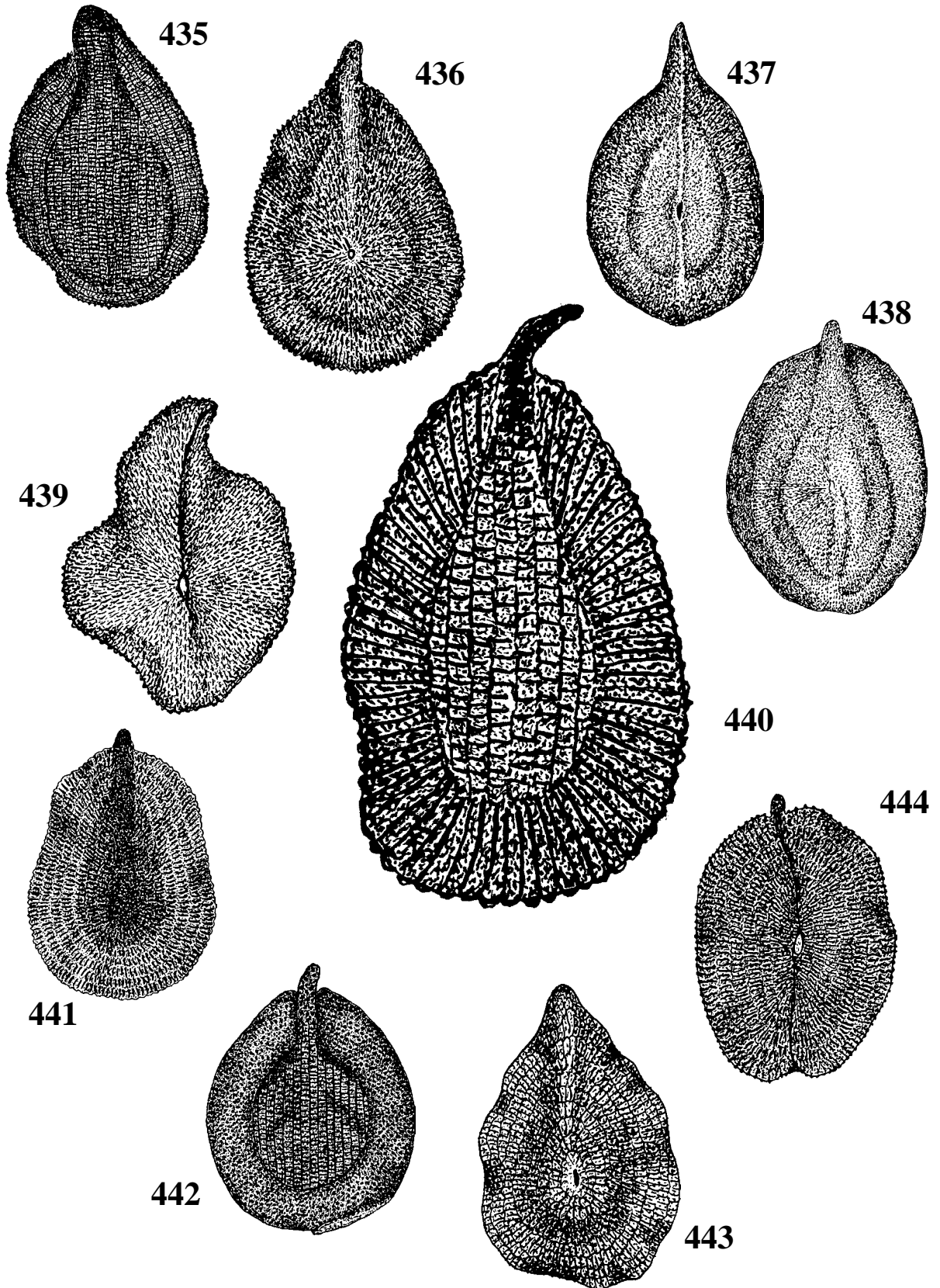
**440. *Dianthus hypanicus*** Andr. — Perennial, usually puberulent with a stout stock and numerous slender, flowering and non-flowering stems, up to 20-25 cm high. **Seeds shield-formed, compressed, dorsal side convex, ventral concave with a distinct ridge and an indistinct hilum, 1.8-2.4 x 1.2-1.7 mm. Surface dense wrinkly, slight lustrous, blackish.** Native to the Ukraine, on granite slopes and denuded places. Uk.

**441. *Dianthus leptopetalus*** Willd., *D. lanceolatus* Stev. ex Rchb. — Annual to perennial, up to 50-60 cm high, stems erect with a woody stock, weakly branched, pubescent at base. **Seeds shield-shaped, compressed, dorsal view convex, ventral concave with a longitudinal ridge and a hilum, 3.1-3.5 x 2.2-2.5 mm. Surface wrinkly in circular rows, lustreless, blackish. 2n = 30.** Native to south-eastern Europe and spreading from Macedonia to the lower Volga, rarely on sunny hills and steppes. Mo, Ro.

**442. *Dianthus lumnitzeri*** (Wiesb.) Domin, *D. plumarius* L. subsp. *lumnitzeri* (Wiesb.) Holub. — Perennial, densely caespitose, stems 10-20 cm, obtusely 4-angular, sparsely leafy. **Seeds roundish, strong compressed, dorsal side convex, ventral concave, margin revolute, centrum convex with a hilum, 3-3.4 x 2.4-2.8 mm. Surface wrinkly complete, lustreless, blackish-brown to black. 2n = 90.** Native to central Europe, on karst rocks and the steppes. Hu, Sk.

**443. *Dianthus membranaceus*** Blocki, *D. rehmannii* Blocki, *D. pseudobarbatus* Bess. — Perennial, up to 30-70 cm high, scabrid below, smooth above. **Seeds obovoid or obtriangular, compressed, dorsal side longitudinal, ventral beamy wrinkly, ridge and hilum distinct, 1.8-2.2 x 1.3-1.6 mm. Surface dull, brownish-black to black.** Native to eastern Balkan, on steppes, shrubberies, forest clearings and margins. Mo, Pl, Ro, Uk.

**444. *Dianthus microlepis*** Boiss. — Perennial, stem leafless or with 1-2 pairs of scale-like leaves, 2-10 cm high. **Seeds shield-formed or oval, dorsal face convex, ventral planoconvex with longitudinal ridge and indistinct hilum in the middle, 3-3.4 x 2.1-2.4 mm. Surface dense wrinkly on both sides, lustreless, blackish up to black.** Native in mountains of Bulgaria; in the Carpathians rarely cultivated in gardens as ornamental.



**445. *Dianthus nardiformis*** Janka — Perennial, up to 10-15 cm, glabrous, caespitose, stems slender, numerous, dichotomic ramified. **Seeds oval, obovoid to triangular, dorsal face convex, ventral planoconvex, hilum small, whitish, 2.1-2.5 x 1.4-1.6 mm. Surface dense wrinkly, dull, brownish-black to black.  $2n = 30$ .** Native to the Balkan Peninsula, in very dry, stony, and rocky localities, in the lower Danube valley. Ro.

**446. *Dianthus nitidus*** Waldst. et Kit. — Perennial, subcaespitose, smooth, ascendent, 10-40 cm high, unramified, often with sterile stems. **Seeds shield-formed, compressed on dorsal face with longitudinal, on ventral face beamy arranged wrinkles, 2-2.6 x 1.6-1.9 mm. Surface blackish to black colour.  $2n = 30$ .** Endemic in the West Carpathian mountains areas, on moist calcareous and dolomitic substances. Pl, Sk.

**447. *Dianthus pallens*** Sibth. et Sm. — Annual to perennial, up to 60 cm high, stem ligneous, pubescent at base, slightly ramified in the superior part. **Seeds obovoid, ellipsoid, convex on the dorsal and planoconcave on the ventral side, 2.6-3 x 2.1-2.5 mm. Surface wrinkly, dull, nigrescent to black.  $2n = 30$ .** Native to Balkan, rare in the area extending from eastern Balkan to the Caucasus, on steppes and sunny slopes, rare. Ro, Uk.

**448. *Dianthus petraeus*** Waldst. et Kit., *D. kitaibelii* Janka — Perennial, up to 20-30 cm high, caespitose, glabrous, stems procumbent at base, erect, 4-angular. **Seeds prolonged ellipsoid, shield-shaped, compressed, dorsal side longitudinal, ventral beamy wrinkly, ridge and hilum distinct, margin roughen, 2.9-3.3 x 1.2-1.4 mm. Surface slight lustrous, nigrescent to black.** Native to eastern Balkan, on stony and rocky places, in the subalpine zone. Ro.

**449. *Dianthus pinifolius*** Sibth., *D. serbicus* Wettst. — Perennial, up to 20-40 cm high, densely caespitose, stems 4-angular, slightly scabrous. **Seeds ellipsoidal to obovoid or angular, dorsal face slight convex, ventral concave, beamy wrinkly, margin roughen, 2.5-2.8 x 1.6-1.8 mm. Surface slight lustrous, nigrescent to black.** Native to eastern Balkan, on stony, rocky and sunny slopes, rare. Ro.

**450. *Dianthus platyodon*** Klokov, *D. polymorphus* auct. non M. Bieb. — Perennial, stems 10-30 cm high, leaves c. 1 mm wide, linear, acute, 1 or more flowers

in a head, petal-limb 5-8 mm, bearded, deep pink. **Seeds roundish, transversal compressed, concavo-convex, 1.1-1.3 x 0.9-1.1 mm. Surface fine wrinkly on both sides, lustreless, blackish.** Native to south-eastern Europe, on sandy stands. Uk.

**451. *Dianthus pontederiae*** A. Kern., *D. atrorubens* Neilr. non All. — Perennial, up to 20-50 cm high, caespitose, 4-angular, stems leafed. **Seeds shield-shaped, compressed, dorsal face convex with longitudinal arranged wrinkles, ventral face concave with a weakly distinct ridge and beamy arranged wrinkles, 1.8-2.3 x 1.3-1.7 mm. Surface blackish-brown to black.  $2n = 30$ .** Native to central and eastern Europe, on dry slopes, sandbanks, steppe meadows, in warmer areas. Hu, Ro, Sk.

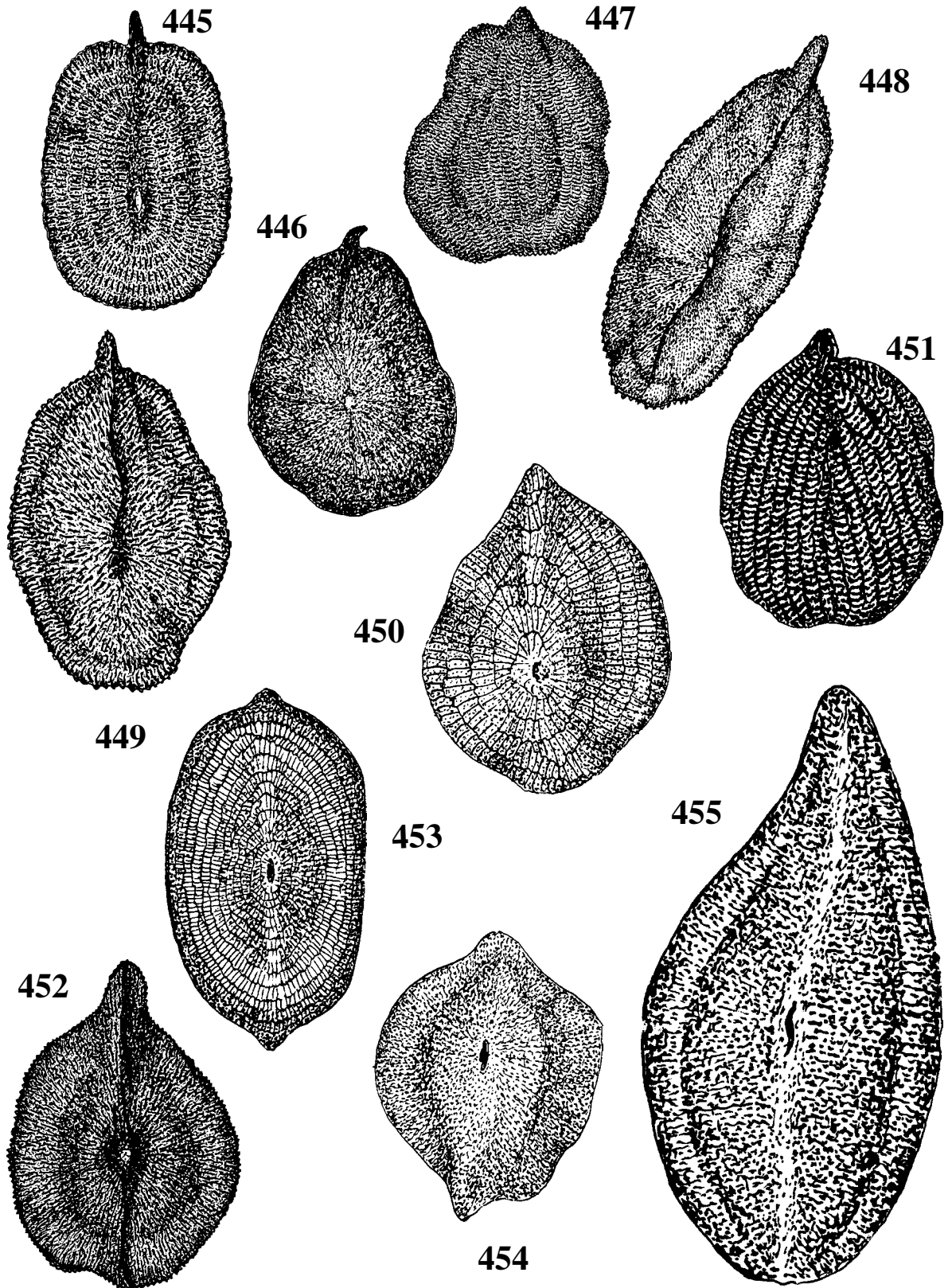
**452. *Dianthus praecox*** Kit., *D. tatrae* Borbás, *D. hungaricus* Pers. — Perennial, a more or less glaucous, up to 40 cm high, flowering stems with some (3-8) pairs of leaves. **Seeds shield-formed, mostly circular, compressed, dorsal view slight convex, its central part wrinkly in longitudinal rows, ventral view concave, 3-3.4 x 2.1-2.3 mm. Surface with beamy arranged wrinkles, blackish-brown to black.  $2n = 90$ .** Carpathian endemic, in calcite rocks, stony, humous, basic to neutral soils. Hu, Pl, Sk.

**453. *Dianthus pseudoarmeria*** M. Bieb. — Annual or biennial, up to 40 cm high, usually pubescent and branched, petal-limb pink. **Seeds ellipsoid, transversal compressed, concavo-convex, 2.1-2.3 x 1.1-1.3 mm. Surface with beamy arranged wrinkles, lustreless, dark-greyish to black.** Native to the lowlands of southeastern Europe. Mo, Ro, Uk.

**454. *Dianthus pseudoserotinus*** Blocki, *D. arenarius* subsp. *pseudoserotinus* (Blocki) Tutin — Perennial, laxly caespitose, glaucous, stems straight, up to 30 cm high, lower leaves long, acuminate, recurved. **Seeds  $\pm$  roundish, compressed transversal, concavo-convex, with wide margins, 2-2.3 x 1.5-1.7 mm. Surface beamy wrinkly, lustreless, blackish.** Native to eastern Europe, on sandy and stony stands, rarely in the northern Ukraine.

**455. *Dianthus pseudosquarrosus*** Novák — Perennial, laxly caespitose, glaucous, up to 40 cm high, lower leaves long, acuminate, recurved. **Seeds obovoid, transversal compressed, concavo-convex, with broaden margin, 1.5-1.7 x 0.7-0.9 mm. Surface fine wrinkly on both sides, lustreless, black.** Native to southeastern Europe, along sandy banks. Br, Uk.





**456. *Dianthus serotinus*** Waldst. et Kit. — Perennial, tufted, slender, 20-30 cm high, stems with 8-14 pairs of leaves. **Seeds shield-formed, convex on dorsal face, only in central part with longitudinal arranged wrinkles, concave on ventral face with beamy arranged wrinkles and distinct ridge, 2.8-3.2 x 2-2.4 mm. Surface blackish to black. 2n = 60, 90.** Endemic to the Pannonian lowland, on sandbanks and sandy grounds. Hu, Pl, Ro, Sk, Uk.

**457. *Dianthus simonkaianus*** Péterfi, *D. integripetalus* Simk. — Perennial, caespitose, stems 10-30 cm, simple or branched, with 1-6 flowers. **Seeds shield-formed, strong compressed, dorsal side convex, with longitudinal arranged wrinkles in the middle, margin with beamy arranged wrinkles, with a longitudinal ridge and a hilum, 2.5-3 x 1.8-2 mm. Surface lustreless, black.** Native to the Balkan Peninsula, on calcareous stands. Ro.

**458. *Dianthus spiculifolius*** Schur. — Perennial, shrubby, numerous stems, cylindrical in the inferior, and 4-angular in the superior part. **Seeds ellipsoid, compressed, dorsal side convex, longitudinal wrinkly, ventral planoconvex or concave, beamy wrinkly, ridge and hilum distinct, margin broad non-roughen, 3-3.4 x 1.8-2.1 mm. Surface slight lustrous, nigrescent to black. 2n = 90.** Native to the East Carpathians, in stony calcareous localities, from the montane to alpine zones. Ro, Uk.

**459. *Dianthus squarrosus*** M. Bieb. — Perennial, laxly caespitose, 15-30 cm high, inflorescence branched. **Seeds ellipsoid, compressed, shield-formed, dorsal side convex, ventral side concave with a distinct ridge and a hilum, 3.4-3.8 x 1.8-2 mm. Surface wrinkly, dull, black, on both sides.** Native to south-eastern Europe, on sandbanks. Uk.

**460. *Dianthus superbus*** L. — Perennial, up to 30-90 cm high, stems decumbent below, ascendent to erect and branched above. **Seeds shield-formed, convex on the dorsal face with the indistinct arrangement of wrinkles, concave on ventral face, with a distinct ridge, mostly in the lower part, 1.8-2.2 x 1.2-1.5 mm. Surface blackish-brown to black. 2n = 30, 60.** Originally an Eurosiberian plant, in mixed and deciduous woodlands, damp meadows, in chalk-free soils. Br, Hu, Pl, Ro, Sk, Uk.

**461. *Dianthus sylvaticus*** Hoppe ex Willd., *S. seguieri* Vill. subsp. *sylvaticus* (Hoppe ex Willd.) Hegi — Perennial, loose tufted, smooth, bright-green, decum-

bent, branched, 20-30 cm high plant. **Seeds shield-formed, ellipsoidal, slight convex with longitudinal arranged wrinkles on dorsal face, concave with beamy arranged wrinkles on ventral face, distinct ridge only in the bottom part, 2.1-2.5 x 1.7-2 mm. Surface blackish-brown to black. 2n = 60.** Native to central Europe; in the Carpathians in light forests and thickets, swampy meadows and pastures. Ro.

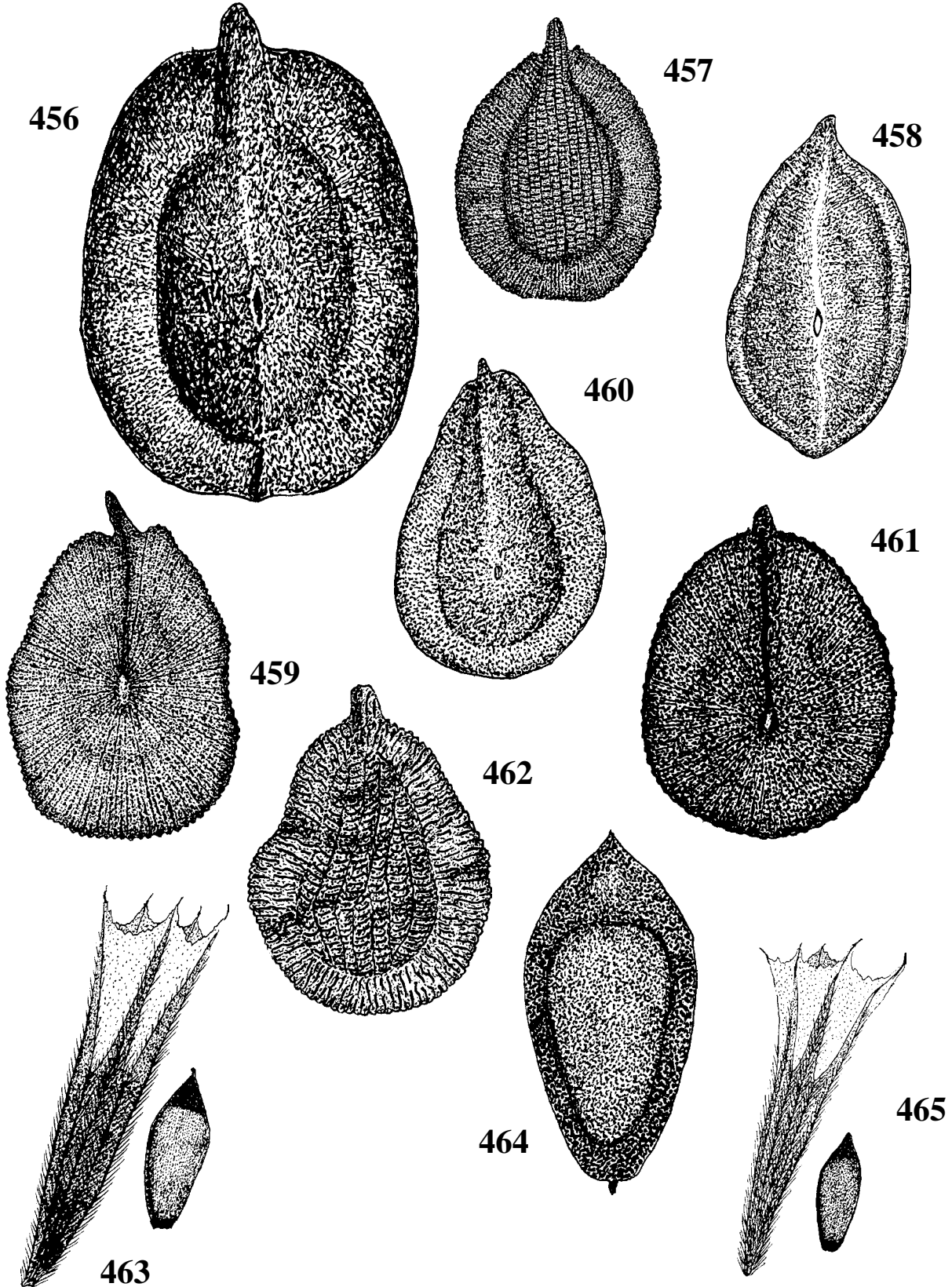
**462. *Dianthus tenuifolius*** Schur — Perennial, up to 25 cm high, caespitose, stems numerous. **Seeds obovoid to ellipsoid, dorsal face convex, longitudinal wrinkly, ventral concave, beamy wrinkly, ridge distinct, 2-2.5 x 1.5-1.8 mm. Surface slight lustrous, brownish-black to black.** Native to the East Carpathians, on stony and grassy slopes in the montane zone. Ro.

### 33. PLUMBAGINACEAE

**463. *Armeria alpina*** Willd., *A. maritima* subsp. *alpina* (Willd.) P. Silva — Perennial, up to 25 cm high, stems erect, bare, with a dense, compact flower head. **Fruits capsules, dry, enclosed in persistent durable dense hirsute calyx, dehiscing transversely, 5.0-6.0 x 1.0-1.2 mm. Seeds obovoid, biconvex, with acuminate apex and lateral rib, 2.2-2.4 x 0.8-1 mm. Surface dense, faint furrowed, slight lustrous, brown, apex and base darker. 2n = 18.** Native to the Alps and the Carpathians, on turf slopes with calcareous soils.

**464. *Armeria caespitosa*** Boiss. — Perennial, stems up to 5-8 cm high, densely caespitose, with grassy leaves, flowers relatively large in roundish headlets, pink. **Seeds obovoid, lateral compressed, biconvex, apex acuminate, bottom narrowed and truncate, 2.2-2.4 x 1-1.2 mm. Surface dense, longitudinal punctulate, faint lustrous, dark-brown.** Native to the Pyrenees; in the Carpathians planted in rock-gardens among the rocks and stones, on sunny, humous and sandy stands.

**465. *Armeria canescens*** Host. — Perennial, stems 30-60 cm high. **Fruits capsules, dry, enclosed in persistent durable dense hirsute calyx, dehiscing transversely, 5.5-6.0 x 0.9-1.1 mm. Seeds ellipsoid, roundish in the transversal section, apex blunt acuminate, bottom truncate, 2.2-2.5 x 0.7-0.8 mm. Surface glabrous, slight lustrous, pale, apex dark-brown.** Native to the Balkan Peninsula. Naturalized in Poland.



**466. *Armeria elongata*** (Hoffm.) Koch, *A. pocutica* Pawl. — Perennial, stems 22-55 cm high, glabrous, flower pinkish. **Fruits capsules, dry, enclosed in persistent durable dense hirsute calyx, dehiscing transversely, 5-5.6 x 1-1.2 mm.** Seeds obovoid, lateral slight compressed, with acuminate apex and lateral rib, 2.2-2.6 x 0.8-1 mm. Surface glabrous, faint lustrous, dark-brown, apex and base darkish to blackish.  $2n = 18$ . Native to the mountains of Europe, on dry meadows, forest clearings, pastures, rocks, sandbanks, on uncalcite grounds. Br, Hu, Pl, Ro, Sk, Uk.

**467. *Armeria maritima*** (Mill.) Willd., *Statice maritima* Mill. — Perennial, up to 10-50 cm high, downy, with a compact flower head. **Fruits capsules, dry, enclosed in persistent durable dense hirsute calyx, dehiscing transversely, 3.2-3.8 x 1.4-1.8 mm.** Seeds prolonged obovoid, biconvex, with acuminate apex and lateral rib, 2-2.2 x 0.8-1 mm. Surface dense furrowed, dull, brown, apex and base a little darkish.  $2n = 18$ . Native to southern Europe, on sandbanks, sandy pine forests, dry meadows, salt marshes. Hu, Pl, Ro, Sk.

**468. *Limonium bellidifolium*** (Gouan) Dumort, *L. caspium* (Willd.) Gams, *Statice caspia* Willd., *S. bellidifolia* (Gouan) DC. — Perennial, stem 10-40 cm high, thickened below, smooth, much branched from base. **Fruits capsules, usually exerted from persistent calyx, 3.5 x 0.7 mm.** Surface brownish green. Seeds ellipsoid, apex narrowed and blunt acuminate, base truncate, 1.6-1.8 x 0.5-0.7 mm. Surface smooth, lustrous, reddish-brown, apex and base darkish. Native to central Europe, Asia Minor, on sandy and saline meadows, sea-shores; a garden plant, inflorescences used in making dry bouquets. Mo, Ro, Uk.

**469. *Limonium dodartii*** Girard, *L. binervosum* (Sm.) Salmon — Perennial, 20-30 cm high, glabrous, smooth. **Fruit capsules, usually exerted from persistent calyx, usually capped by marcescent corolla and style bases.** Surface brownish green. Seeds prolonged ellipsoidal, slight compressed, ribbed on the lateral face, 1.7-2 x 0.5-0.6 mm. Surface faint foveolate, lustrous, brown, bottom part and ribs dark-brown.  $2n = 34-36$ . Native to western Europe, on maritime cliffs and rocks; in the Carpathians cultivated in gardening as a decorative plant, inflorescences used in making dry bouquets.

**470. *Limonium gmelinii*** (Willd.) O. Kuntze, *L. hypanicum* Klovov, *Statice gmelinii* Willd. — Perennial, up to 20-60 cm high, stems erect, smooth, spreading branched. **Fruits capsules, usually exerted from persistent on the rib and at base hirsute calyx, usually capped by marcescent corolla and style bases, 4-4.4 x 1.1-1.3 mm.** Surface brownish green. Seeds obclavate, with a lateral rib, apex conical, constricted base with a hilum, 3-3.4 x 0.9-1.1 mm. Surface faint furrowed, slight lustrous, dark-brown.  $2n = 36$ . Native to Eurasia, in saline, in spring damp, in summer drying up soils, flooded meadows of lowlands and sea-shores. Hu, Mo, Ro, Sk, Uk.

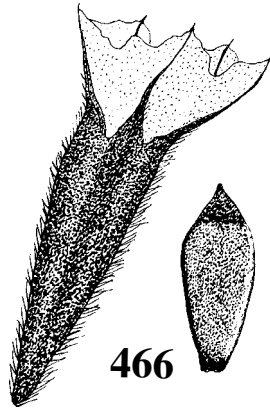
**471. *Limonium latifolium*** (Sm.) O. Kuntze, *Statice latifolia* Sm. — Perennial, up to 20-80 cm high, stems erect, branched above, many sterile shoots below. **Fruits capsules, usually exerted from persistent on the rib and at base hirsute calyx, usually capped by marcescent corolla and style bases, 4-4.6 x 0.8-1.0 mm.** Seeds cylindrical, compressed, with a narrow lateral rib, biconvex apex and base constricted, 2.9-3.1 x 0.6-0.8 mm. Surface faint furrowed, apex acuminate, lustrous, brown, apex and base dark-brown. Native to southern and eastern Europe, on steppes and dry grasslands. Mo, Ro, Uk.

**472. *Limonium meyeri*** (Boiss.) O. Kuntze, *Statice meyeri* Boiss. — Perennial, up to 20-60 cm high, glabrous, scales 6-9 mm, stems erect. **Fruits capsules, usually exerted from persistent on the rib and at base hirsute calyx, 4-4.4 x 1-1.2 mm.** Surface brownish green. Seeds prolonged ellipsoid, compressed, dorsal side convex, ventral side concave, 2.4-2.8 x 0.7-0.9 mm. Surface faint foveolate, dark-brown. Native to southern and eastern Europe and southwestern Asia, on saline soils and steppes. Uk.

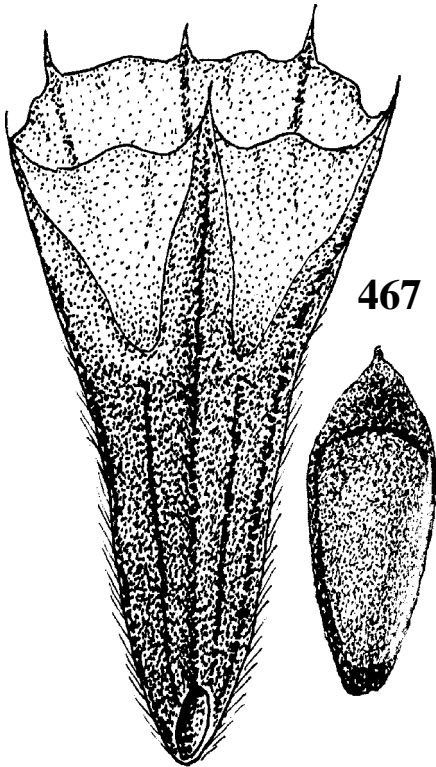
**473. *Limonium sinuatum*** (L.) Mill., *Statice sinuata* L. — Perennial, up to 20-40 cm high, stems and twiglets undulately winged. **Fruits capsules, usually exerted from persistent on the rib and at base hirsute calyx, 7-7.2 x 1.5-1.7 mm.** Surface brownish green. Seeds prolonged obovoid with some longitudinal furrows or smooth, apex truncate, 3.8-4.2 x 1-1.2 mm. Surface superior part and base nigrescent, the rest brown.  $2n = 18$ . Native to southern Europe, in dry, sandy places; often cultivated in gardens for making dry bouquets. Hu, Sk.



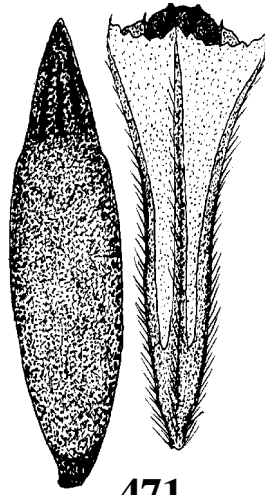
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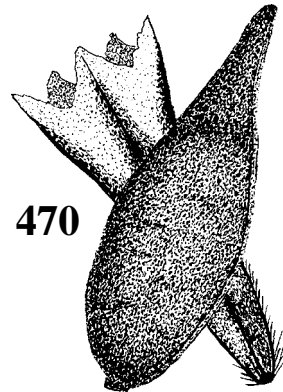
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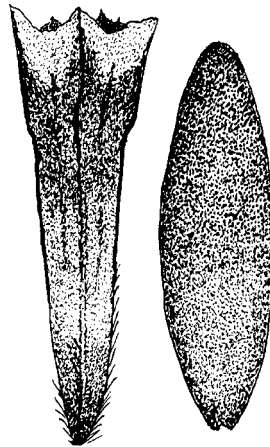
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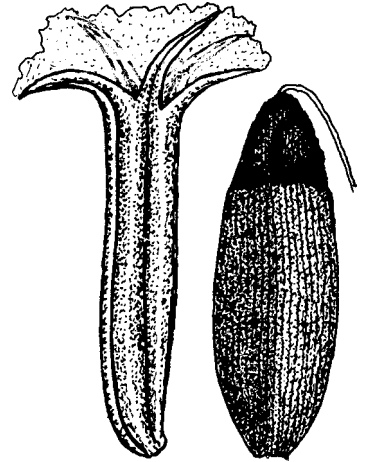
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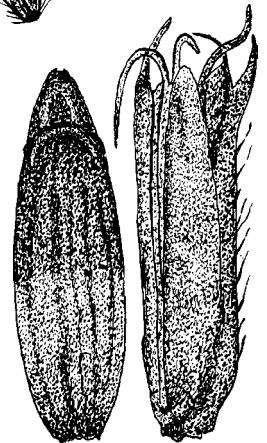
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**474. *Limonium vulgare*** Mill., *Statice limonium* L. — Perennial, stems 15-40 cm high, glabrous, flowering stems branched in the upper half, branches short, crowded, corolla reddish. **Fruits capsules, usually exserted from persistent on the rib and at base hirsute calyx, usually capped by marcescent corolla and style bases, 5-6 x 0.9-1.1 mm. Surface brownish green. Seeds spindle-form, bottom narrowed, with some furrows, 2.7-2.9 x 0.8-0.9 mm. Surface blackish-brown. 2n = 36.** Native to western and northern Europe, on maritime self-marshes. Ro.

**475. *Goniolimon tataricum*** (L.) Boiss., *Limonium tataricum* Mill., *Statice tatarica* L. — Perennial, up to 10-40 cm high, stems simple, ramified at base, strongly winged. **Fruits capsules, usually exserted from persistent on the rib and at base hirsute calyx, usually capped by marcescent corolla and style bases, 6.5-7.5 x 1-1.2 mm. Surface brownish green. Seeds obclavate or cylindrical with a narrowed apex, 2.8-3.2 x 0.7-0.9 mm. Surface smooth or faint longitudinal furrowed, lustrous, brown, apex and base darkish.** Native to eastern and southeastern Europe, on arid steppes in lowlands and uplands. Hu, Mo, Ro, Uk.

**476. *Plumbago europaea*** L., *P. lapathifolia* Willd. — Perennial, up to 1 m high, stems erect, ramified at base. **Fruits included capsules, long-beaked, valves coherent at apex, 6.2-7 x 2.6-3 mm. Surface brownish. Seeds tear-shaped, with five thin ribs, apex narrowed to acuminate, base rounded or five-angled, 5.9-6.2 x 2-2.2 mm. Surface glabrous, lustrous, black. 2n = 12, 14.** Native to southern Europe, in rocky, stony to steppe localities; sometimes cultivated in gardens for ornament. Ro, Sk.

### 34. CHENOPODIACEAE

**477. *Polycnemum arvense*** L., *P. minus* (Doll.) Kit. — Annual, up to 30-50 cm high, stems procumbent or erect, with spirally twisted branches, densely ramified. **Fruits utricle, enclosed in perianth, barrel-shaped or oval, slightly compressed, broadly elliptic, perianth membranous with the rest of a style at the apex, base truncate, pericarp slightly thickened apically, easily separated from seed, 1.4-1.7 x 1.2-1.1 mm. Surface dense tuberculate, nigrescent to black. 2n = 24.** Native to southern and central Europe up to central Asia, on sandy and gravelly grounds; as a weed in dry cornfields, throughout the Carpathians.

**478. *Polycnemum heuffelii*** Láng — Annual, up to 5-30 cm high, stems procumbent and ascendent. **Fruits utricle, enclosed in perianth, barrel-shaped, elliptic, perianth membranous with the rest of a style at the apex, base truncate, 1.5-1.7 x 1.2-1.3 mm. Surface dense tuberculate, perianth yellow-brown, seeds black.** Native to central Europe, on dry sandy fields and wastes. Hu, Pl, Ro, Sk, Uk.

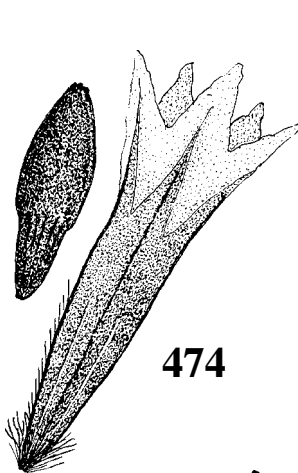
**479. *Polycnemum majus*** A. Braun — Annual or biennial, up to 5-30 cm, glabrous, bare, stems procumbent or erect. **Fruits utricle, enclosed in perianth, ovoid-oval, compressed, wrinkly, with 4-5 arrow-shaped pointed leaflets, 1.8-2.2 x 1.4-1.6 mm. Surface dirty yellowish-brown. Seeds 1.5-2 mm. Proper seeds tuberculate, nigrescent to black.** Native to central Europe as far as Asia, on sandy fields, grassy and stony places, often as a ruderal. Hu, Mo, Pl, Ro, Sk, Uk.

**480. *Polycnemum verrucosum*** Láng — Annual, up to 5-15 cm high, stems tender, puberulent, glandular, shortly ramified. **Fruits utricle, enclosed in perianth, barrel-shaped, membranous, with the rest of the style at the apex, 1.4-1.6 x 1.1-1.3 mm. Surface verrucose, dirty yellow-brown. Proper seeds black.** Native to continental (Pontic-Pannonian) Europe, on fields, vineyards, on loam-sandy and gravelly grounds. Hu, Ro, Sk, Uk.

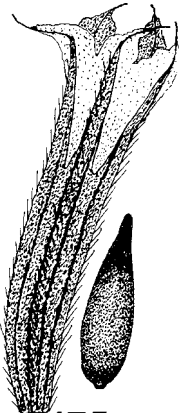
**481. *Hablitia tamnoides*** M. Bieb. — Perennial, stems slender, voluble. **Seeds reniform, flattish, biconvex, margin rounded, radicle little longer than cotyledons, 1.4-1.6 x 1.3-1.5 mm. Surface smooth, glossy, black.** Originally growing in the Caucasus, rarely hauling into eastern Europe. Ro.

**482. *Beta maritima*** L., *B. perennis* (L.) Freyn — Perennial, with a thin root, stems ramified, 60-100 cm high, procumbent to erect. **Fruits catoclesium, connate with receptacle, often enclosed by swollen perianth, pseudocarp 2-5-seedy, perianth up to 3 mm, connivent above the fruit, the segments ± triangular or spatulate, 6.5-8.5 x 6-7 mm. Surface yellow-brown. Seeds horizontal, orbicular or reniform, tip of radicle prominent, 1.8-2.2 x 1.4-1.8 mm. Surface smooth, dark-brown. 2n = 18.** Native to the coasts of southern and western Europe and salty soils inland, on sandy waste places. Uk.

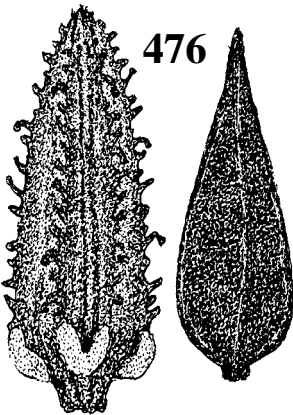
**483. *Beta trigyna*** Waldst. et Kit. — Perennial, up to 130 cm high, stems angular, trenched. **Fruits catoclesium, connate with receptacle, often enclosed by**



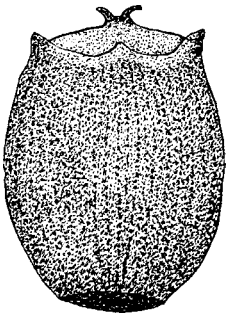
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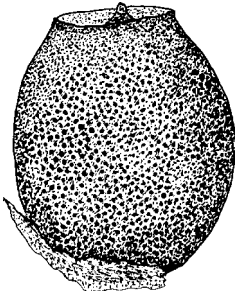
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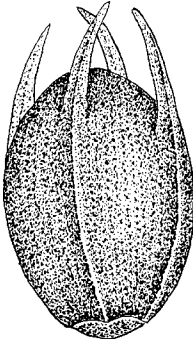


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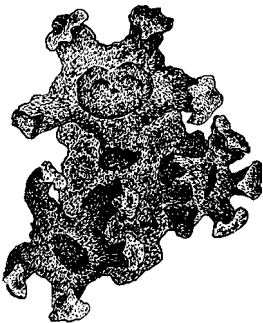


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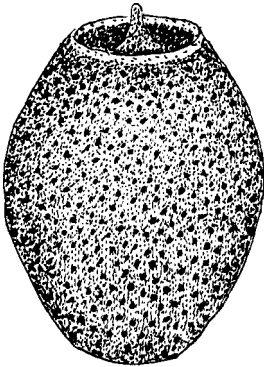
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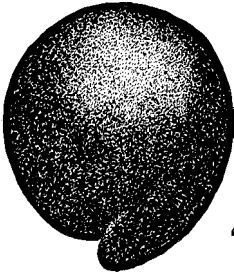
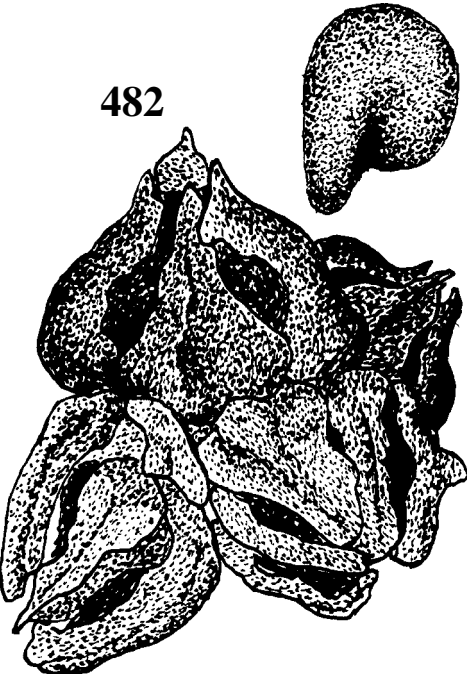
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swollen perianth, receptacle pelviform, perianth segments erect in fruit, 6-8 x 5.5-6.5 mm. Surface blackish-brown. Seeds verrucose.  $2n = 36$ , 54. Originally growing in southeastern Europe, on steppes, roadsides, fields; occasionally cultivated as source of genes, seldom escaping on waste grounds. Mo, Ro, Uk.

**484. *Beta vulgaris* L. subsp. *vulgaris*** — Annual to perennial, root fleshy, thickened, stem stiff, erect, up to 150 cm high, glabrous, sturdy, ramified. **Fruits catoclesium, cluster with 2-6 fruits, 2-7 x 2-7 mm. Surface pale orange-yellow or nut-brown. Seeds circular or ellipsoid, compressed, tip of radicle free, 2.4-2.8 x 2-2.4 mm. Surface brown or henna.  $2n = 18$ , 27, 36.** Arised from *B. maritima* L.; cultivated in many cvs for high contents of sugar, allover the Carpathians.

**485. *Chenopodium acerifolium* Andrz., *Ch. klink-graeffii* (Abrom.) Aellen** — Annual, little downy up to bare, reddish, later yellowish, stems up to 100 cm high, erect. **Seeds roundish, compressed horizontal, with a distinct radicle, 1.2-1.4 x 1.1-1.3 mm. Surface smooth, pits on testa of seeds less deep and regular, lustrous, black.** Native to Eurasia, on sandy and swampy riverbanks, boundaries, waste grounds, gardens. Uk.

**486. *Chenopodium album* L., *Ch. leiospermum* DC.** — Annual, grey-farinose, stem erect or procumbent, green or red banded, 1-2 m high. **Seeds circular, flattish, biconvex or concavo-convex, margins slight keeled, tip of radicle more projected than that of the cotyledons, 1.4-1.6 x 1.3-1.5 mm. Surface lustrous, very faint furrowed, black.  $2n = 54$  (18, 36).** Originally growing in Eurasia, now cosmopolitan, common weed in fields, gardens and waste places, throughout the Carpathians.

**487. *Chenopodium ambrosioides* L., *Ch. anthelminthicum* L.** — Annual, rarely perennial, glandular, aromatic, hairy, up to 30-100 cm high, stems erect, branched. **Seeds globular or globular-cylindrical, flattish, biconvex, margin obtuse, testa almost smooth, sometimes with obscure shallow pits, tip of radicle indistinct, 0.6-0.8 x 0.6-0.8 mm. Surface smooth, glossy, glabrous, lustrous, dark-purple.  $2n = 32$ .** Place of origin probably tropical America; previously cultivated as a vermifuge (anthelminticum) and naturalized throughout the Carpathians.

**488. *Chenopodium aristatum* L.** — Annual, up to 30 cm high, bushy, much-branched, glabrous or sparsely glandular. **Seeds spherical, biconvex, slight compressed, on margin with a narrow brim, 0.6-0.7 x 0.6-0.7 mm. Surface glabrous, slight lustrous, reddish-black.** Native to the Ural, Asia, North America, on sands, weedy and open places; naturalized in Hu, Uk.

**489. *Chenopodium berlandieri* Moq.** — Annual, whitish downy, later on bare, stems erect, up to 150 cm high, branched above. **Seeds rounded, horizontal compressed with distinct radicle at margin, 1.7-1.9 x 1.5-1.7 mm. Surface fine undulate, lustreless, yellowish, radicle pale-brown.  $2n = 36$ .** Native to North America; hauling into the Carpathians, on railway stations, depots, waste places, in subsp. *zschackei* (Murz.) Zab.

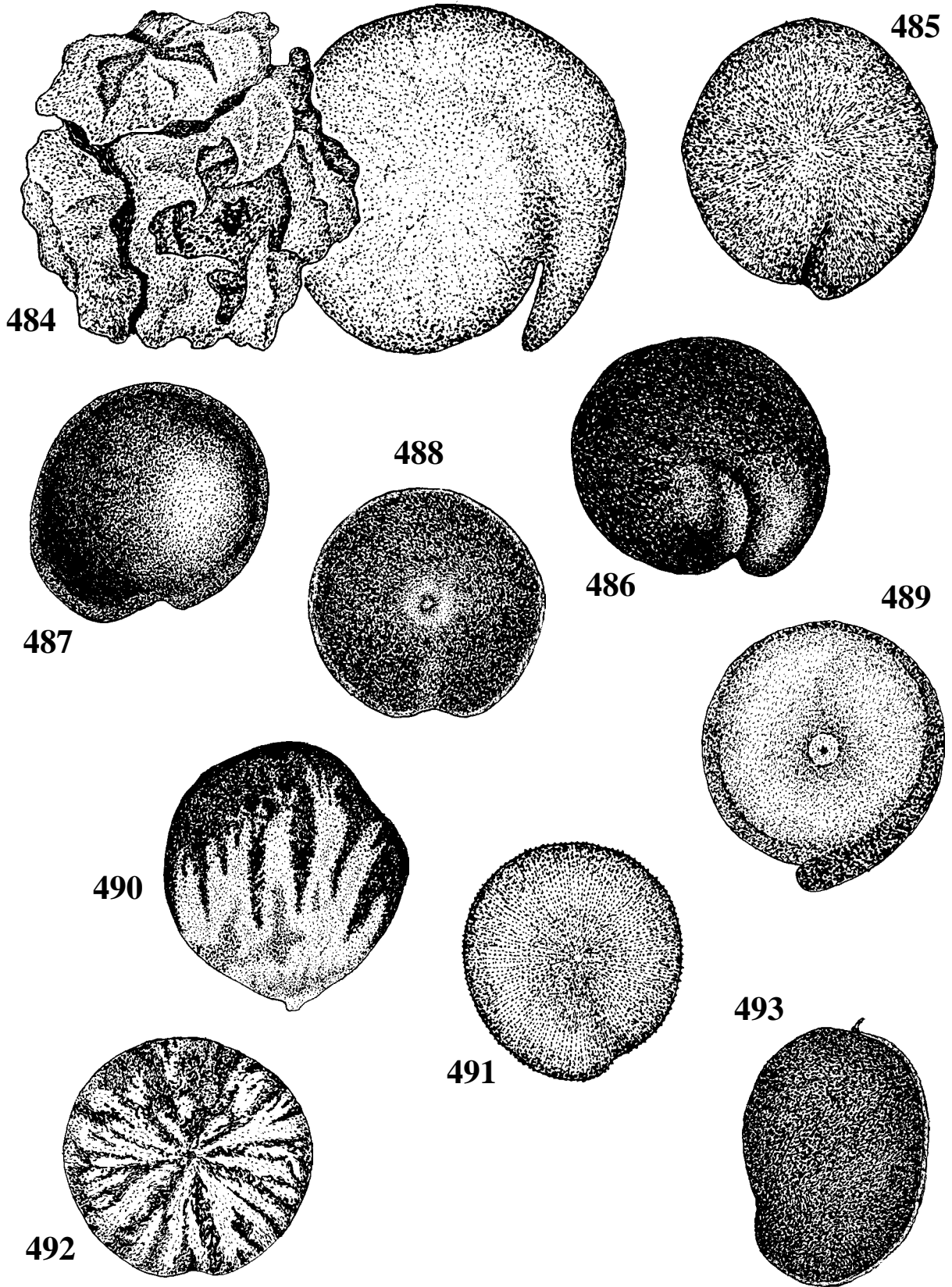
**490. *Chenopodium bonus-henricus* L., *Blitum bonus-henricus* (L.) C. A. Mey.** — Perennial, stems erect or ascendent, faintly farinose, 60-80 cm high. **Seeds rounded, reniform, compressed, biconvex, tip of radicle not longer than the cotyledons, 1.7-1.9 x 1.5-1.7 mm. Surface lustrous, sculptured with irregular lines, purple to dark purple-brown.  $2n = 36$ .** Native to Siberia, North America, introduced and naturalized in Europe, near villages and farms, orchards, rarely in fields, formerly used as food. Br, Hu, Pl, Ro, Sk, Uk.

**491. *Chenopodium botryoides* Sm., *Ch. crassifolium* Hornem, *Ch. chenopodioides* L.** — Annual, up to 50 cm high, stems spreading or decumbent, young leaves farinose. **Seeds circular or elliptic, flattish, faces biconvex, radicle slight longer than cotyledons, 1-1.2 x 0.9-1.1 mm. Surface lustrous, with hardly visible lines, dark purple-brown.  $2n = 18$ .** Coasts of the Atlantic and Mediterranean, inland on salt marshes. Hu, Mo, Pl, Ro, Uk.

**492. *Chenopodium botrys* L., *Botrydium botrys* (L.) Small** — Annual, 20-70 cm high, fragrant, viscid, glandular, stems erect, unbranched. **Seeds globular, lenticular, biconvex, angles rounded, tip of radicle indistinct, 0.7-0.8 x 0.7-0.8 mm. Surface glabrous, lustrous, dark-grey.  $2n = 18$ .** An Eurasian plant, on sandy, stony, nutrient-rich soils, roadsides, river-beds; in warmer areas of the Carpathians.

**493. *Chenopodium capitatum* (L.) Asch., *Blitum capitatum* L.** — Annual, up to 30-80 cm high, glabrous, stems erect or ascendent, sometimes ramified. **Seeds**





cylindrical or globular, flattish, biconvex, with indistinct tubercles, margin brimmed partial, 0.8-1 x 0.6-0.8 mm. Surface glossy, dull or faint lustrous, reticulate-punctate, blackish-brown to black.  $2n = 16, 18$ . Native to North America; previously cultivated as vegetable, now seldom hauling into moist waste places. Br, Hu, Pl, Ro, Sk, Uk.

**494. *Chenopodium ficifolium* Sm., *Ch. trilobatum* Kit., *Ch. viride* Curtis non L.** — Annual, up to 30-100 cm high, stems usually erect, broadly branched, greyish farinose. **Seeds circular, biconvex, margin keel obtuse, tip of the radicle more projected than the cotyledons, 1-1.1 x 0.9-1 mm. Surface lustrous, fine furrowed, reticulate-punctate, dark- to blackish-brown.  $2n = 18$ .** Originally growing in the Mediterranean and eastern Asia regions, on dry to moist soils, rich in nutrients. Hu, Pl, Ro, Sk, Uk.

**495. *Chenopodium foliosum* (Moench.) Asch., *Blitum virgatum* L.** — Annual to biennial, up to 15-100 cm high, faintly farinose, stems glabrous, erect, only at base sometimes branched. **Seeds circular to subreniform, lenticular, plane, radicle as long as cotyledons, 0.9-1.1 x 0.9-1.1 mm. Surface lustreless, dense dotted, dark- to blackish-brown.  $2n = 18$ .** Native to Asia, scattered throughout Europe, in mountains; originally cultivated as vegetables, now seldom on waste places; in the whole Carpathians.

**496. *Chenopodium giganteum* D. Don, *Ch. amaranticolor* Coste et Reyn.** — Annual, up to 2-3 m high, young parts of the plant conspicuously tinged with vivid reddish-purple. **Seeds  $\pm$  spherical, biconvex, compressed, with a distinct radicle, 1.2-1.4 x 1-1.2 mm of pale-rusty colour and 1.4-1.6 x 1.2-1.4 mm of black colour. Surface of both glabrous, lustrous.  $2n = 18$ .** Native to northern India; in Carpathians rarely cultivated in gardens as ornamental and occasionally naturalized.

**497. *Chenopodium glaucum* L., *Orthosporum glaucum* (L.) Peterm.** — Annual, up to 20-100 cm high, stems procumbent or erect, much branched, glabrous or almost so. **Fruits perianth containing utricles, circular to ovoid, pericarp nonadherent, thin, greenish and free or almost so, perianth segments yellowish-green, not connate above the middle, margin keelless, lateral view biconvex, 1.2-1.4 mm in diam. Surface high lustrous, smooth or very fine dotted. Surface of own seeds purple-brown, rare blackish-brown.  $2n = 18$ .** Most of

Europe except the extreme north, now cosmopolitan on roadsides, waste grounds, saline soils; throughout the Carpathians.

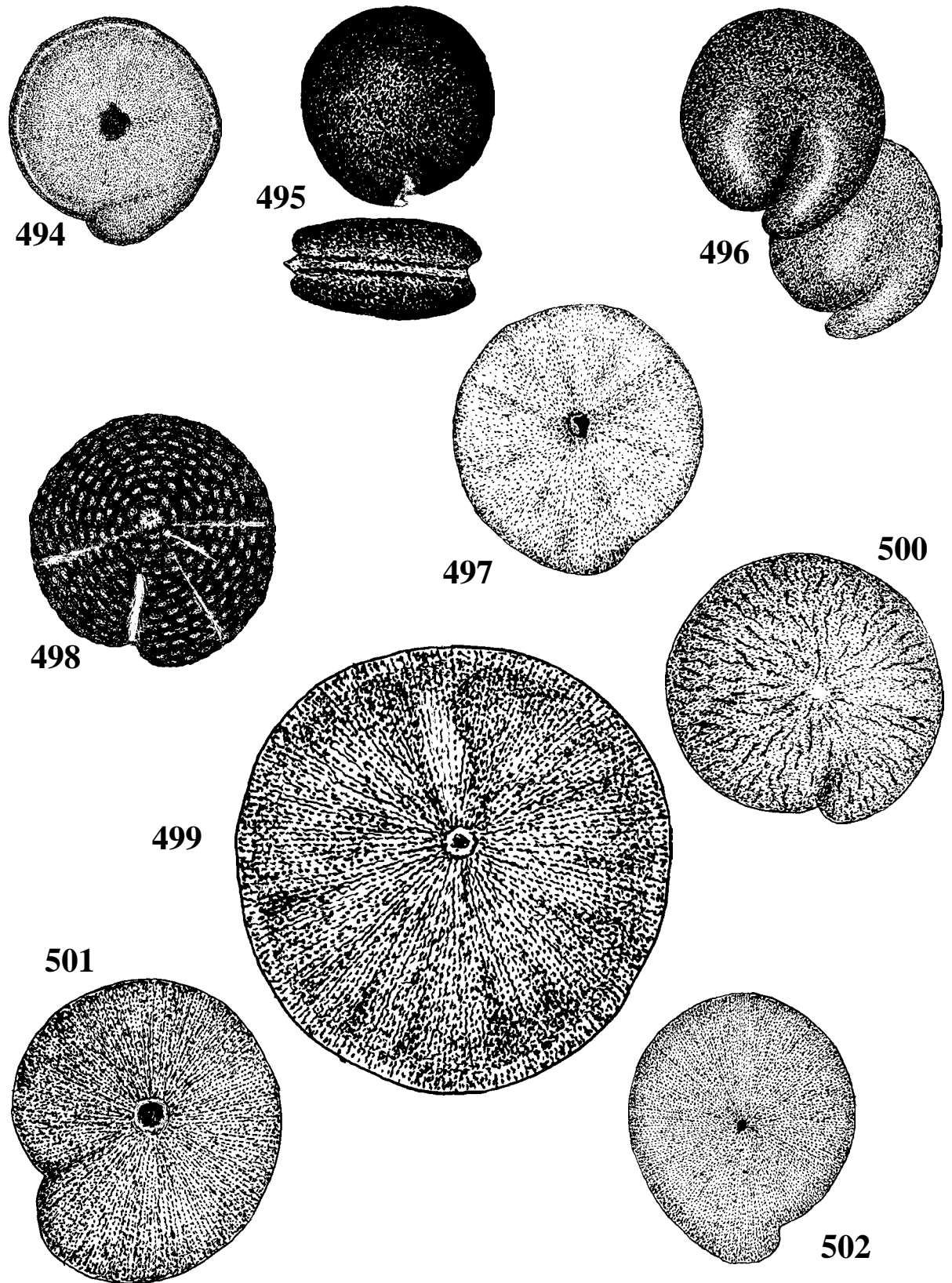
**498. *Chenopodium hybridum* L., *Ch. integrifolium* Vorosch.** — Annual, up to 30-100 cm, young plant faintly farinose, later on bare, smelling, stems erect, ramified. **Seeds circular, biconvex, margin keelless, radicle and cotyledons indiscernible, 1.6-1.8 mm in diam. Surface lustrous, sculptured with rounded or elliptic cavities, black.  $2n = 18$ .** Native to Eurasia, fast cosmopolitan; originally cultivated as vegetable, weed of cultivated soils and waste places; in the whole Carpathians.

**499. *Chenopodium murale* L.** — Annual, up to 20-100 cm high, stems erect, or spreading, usually much branched, scarcely leafy, smelling, farinose. **Seeds circular, lateral view biconvex, tip of the radicle and cotyledons indiscernible, 1.1-1.3 mm in diam. Surface margin acutely lustrous to lustreless, numerous pitted, black.  $2n = 18, 36$ .** Most of Europe, on waste places, roadsides, yards, seldom on fields and gardens. Br, Hu, Pl, Ro, Sk, Uk.

**500. *Chenopodium opulifolium* Schrad. ex Koch et Ziz., *Ch. triangulare* Forskål** — Annual, up to 30-100 cm high, stems erect, much branched, lower shoots ascendent. **Seeds  $\pm$  circular, biconvex, flattish, margin slight rounded, 1.2-1.5 x 1.2-1.5 mm. Surface lustrous, radial grooved, black.  $2n = 54$ .** Native to Eurasia, on waste places, along roadsides, fallows, in the warmest areas; into the Carpathians, invading from the south of Europe. Hu, Mo, Pl, Ro, Sk, Uk.

**501. *Chenopodium polyspermum* L., *Ch. acutifolium* Sm.** — Annual, up to 10-80 cm high, bare or very faint farinose, stems quadrangle, erect or ascendent, poorly ramified. **Seeds circular, biconvex, margin obtuse, 1-1.1 x 0.9-1 mm. Surface high lustrous, faces moreover dense pitted, grooved, dark or black-brown.  $2n = 18$ .** Extending to whole Europe, Siberia and the Orient; weed on fields, gardens, vineyards, roadsides, waste grounds; in the whole Carpathians.

**502. *Chenopodium probstii* Aellen** — Annual, in young state downy, later bare and reddish, stems up to 150 cm high, much ramified. **Seeds rounded, strong compressed lateral, 1.35-1.45 x 1.2-1.3 mm. Surface of the testa brownish, own seed glabrous, lustrous, black.  $2n = 54$ .** Native to southern Australia;



hauling into the Carpathians with wool on dumps and rubbish heaps.

**503. *Chenopodium pumilio*** R. Br., *Ch. carinatum* auct. non R. Br. — Annual, up to 80 cm high, faint fragrant, pubescent, glandular, stems much branched. **Fruits achenes with perianth, ovoid-oval, pericarp adherent, 0.7-0.8 x 0.6-0.7 mm. Seeds near circular, slight flattish, biconvex, 0.5-0.6 mm in diam. Surface lustrous, gentle reticulate, dark-brown. 2n = 18.** Native to Australia; hauling with wool into the surroundings of factories, roadsides, railway stations, dumps and agricultural stands, naturalized. Ro, Sk.

**504. *Chenopodium quinoa*** Willd. — Annual, up to 150 cm high, stems erect, ramified in the upper half, broadly yellowish striped. **Seeds globular to subreniform, flattish, biconvex, with a distinct lighter margin, hilum rounded, concave, 1.5-1.7 mm in diam. Surface fine reticulate-foveolate, dull, yellowish-white. 2n = 36.** Originally growing in South America, in Europe previously cultivated as vegetable, uniquely naturalized, often used as a test-plant in plant virology.

**505. *Chenopodium rubrum*** L., *Blitum polymorphum* C. A. Mey. — Annual, up to 10-90 cm high, stems glabrous, younglings sometimes farinose, reddish, erect, seldom procumbent, branched. **Seeds circular or elliptic, flattish, faces biconvex, margin not keeled, radicle longer than the cotyledons, c. 0.8 x 0.6 mm. Surface smooth, lustrous, numerous dotted, dark reddish-brown. 2n = 36.** Most of Europe, but rare in the Mediterranean region, on dumps, sandbanks, river valleys; in the whole Carpathians.

**506. *Chenopodium schraderanum*** Schult., *Ch. foetidum* Schrad. non Lam. — Annual, up to 30-100 cm high, branched, of unpleasant odor. **Seeds circular, flattish, 1.2-1.5 mm in diam. Surface gently reticulate with whitish papillae, foveolate, dull, dark-brown. 2n = 18.** Native to tropical and subtropical Africa, sometimes hauling into Europe, as weed on waste places; at present cultivated as a medical plant. Hu, Mo, Ro, Sk, Uk.

**507. *Chenopodium strictum*** Roth, *Ch. striatum* Krašan — Annual, up to 100 cm high, pubescent, stems little branched, reddish- or purple-striped. **Seeds circular, oval or ovoid, biconvex, margin roundish or not expressive keeled, 1.2-1.4 x 1-1.2 mm.**

**Surface dotted, smooth, lustrous, blackish. 2n = 36.** Native probably to eastern Asia, invading into warmer areas as weed in field stands, mainly into root crops, railway stations, dumps. Hu, Ro, Sk.

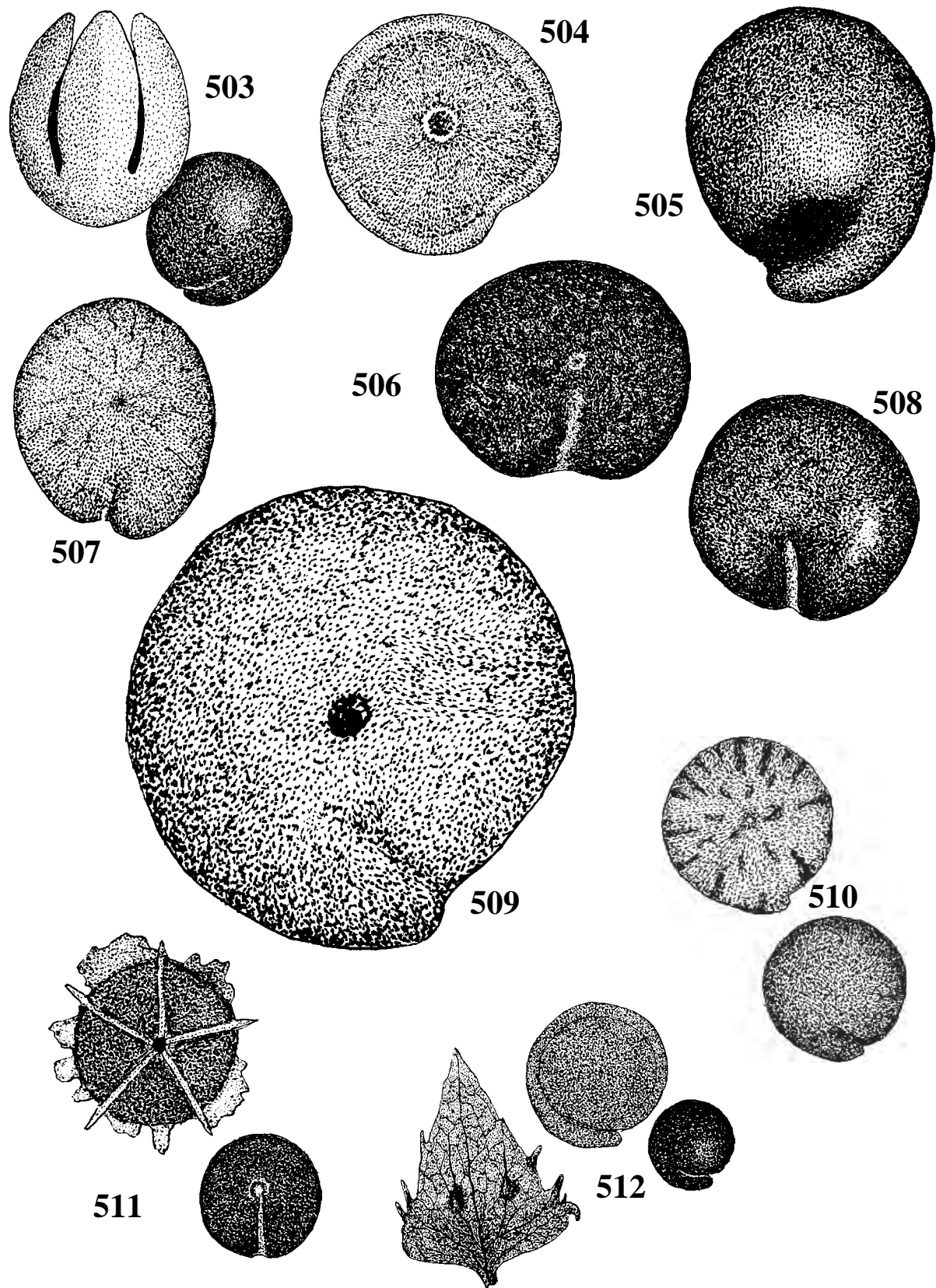
**508. *Chenopodium sudesicum*** Murr., *Ch. viride* Aellen — Annual, up to 80-120 cm high, stems green, only in forked branch, reddish spotted, young leaves farinose. **Seeds near circular, biconvex, margin rounded, 1.3-1.5 x 1.2-1.4 mm. Surface fine verrucose, lustrous, black. 2n = 18.** Native to northern Europe, hauling to central Europe, near railway stations and dumps. Hu, Ro, Uk.

**509. *Chenopodium urbicum*** L., *Ch. deltoideum* Lam. — Annual, up to 30-100 cm high, young shoots sparingly farinose, glabrous later on, stems erect, little branched. **Seeds circular to reniform, slight biconvex, margin obtuse, 1-1.2 x 1-1.1 mm. Surface high lustrous, mostly slight verrucose, seldom smooth, dark- to blackish-brown. 2n = 18.** An Eurasian element, weed of cereals, roadsides, moist ditches, brookbanks; in warmer areas of all the Carpathians mountains.

**510. *Chenopodium vulvaria*** L., *Ch. foetidum* Lam. non Schrad. — Annual, up to 10-30 cm high, smelling as decaying fish, viscid, strongly farinose, stems ascendent, much branched. **Seeds irregular circular to ovoid, biconvex, margin blunt, 1-1.5 mm in diam. Surface lustrous, almost smooth or with faint furrows, reticulate, black or black-brown. 2n = 18.** Indigenous to Eurasia, secondary cosmopolitan plant, ruderal and as weed; throughout the Carpathians territory.

**511. *Cycloloma atriplicifolium*** (Spreng.) Coulter, *C. platyphyllum* (Michx.) Moq. — Annual, switchly branched, crisply wavy, 20-60 cm high, pubescent, stems erect, angular, grooved. **Fruits achenes, 1-seeded, perianth about 2 mm in diam., surrounded by a flat, circular, nearly transparent wing about 0.5 mm across, 2.3-2.7 mm in diam. Surface dull, tuberculate-downy, greyish-brown. Seeds 1.5-1.7 mm in diam. Surface lustrous, radial verrucose, nigrescent to black. 2n = 36.** Originally growing in North America; uniquely hauling with cereals and naturalized in some places in the Carpathians. Sk.

**512. *Atriplex calotheca*** (Rafn) Fries — Annual, 30-90 cm high, more or less glabrous. **Fruits utricles, tightly inclosed within enlarged bracteoles,**



triangular, conic, pericarp membranous, bracteoles triangular, accrete only on the base, no higher than to 1/2 of bracteoles length, base truncate, dentate, apex acuminate. Surface reticulate venous, green. Seeds  $\pm$  spherical, laterally compressed, biconvex, flattened, mainly vertical, radicle longer than the cotyledons, with two types: *larger*: reddish-brown, compressed and plane, 2.3-2.8 in diam.; *smaller*: compressed and biconvex, 1.4-1.6 in diam. Surface glabrous in both types of seeds.  $2n = 18$ . Native to the coasts of the Baltic Sea, on saline sandy grounds. Pl.

**513. *Atriplex glabriuscula*** Edmonston — Annual, stems 30-60 cm high, procumbent, often reddish. Seeds of 3 types: *biggest*: flattish, brown, 2.5-3 x 2.3-2.7 mm; *medial*: flattish, dark-brown or black, c. 2.2 x 2.5 mm; *smallest*: biconvex, circular, black, c. 1.5-2 mm.  $2n = 18$ . Native to the coasts of western and northwestern Europe, rare, in saline sandy soils. Pl.

**514. *Atriplex hastata*** L., *A. prostrata* subsp. *latifolia* (Wahlenb.) Rauschert — Annual, erect or procumbent, up to 100 cm high, usually green, farinose when young, stems ridged, branched from base. Fruits utricles, pericarp free, tightly enclosed in the fruiting bracteoles, dentate. Seeds  $\pm$  spherical, lateral compressed, flattened mainly vertical, of 2 types: *larger*: with lateral sides flattish, lustrous, dark-brown, 2-2.4 x 1.9-2.3 mm; *smaller*: with lateral sides biconvex, lustreless, greyish-black, 1.3-1.5 in diam. In both types radicle longer than the cotyledons. Native to Europe, ruderal, usually near the coast, on saline soils, riverbanks, trenches, dumps; in the warmest Carpathian regions.

**515. *Atriplex heterosperma*** Bunge, *A. micrantha* C. A. Mey. — Annual, up to 120 cm high, lower leave up to 15 cm long, sagittate. Fruits utricles, seeds enclosed into the round cordate bracteoles, young bracteoles scaly, later naked and dry membranous, exerted reticulate venous, main veins till the base separated, 3.5-4.5 x 3.4-4 mm. Surface venous, brown. Seeds globular, lateral compressed, of two types: *larger*: with both lateral sides flattish, pericarpium smooth, lustrous or lustreless, dark-brown, 2.3-3 x 2.2-2.6 mm; *smaller*: with lateral sides biconvex, pericarpium hard, lustrous or lustreless, greyish to black, 1.6-2 x 1.4-1.8 mm. Native to central Asia, ruderal; rarely hauling into the Carpathians by birds, sometimes

naturalized, in saline sandy soils of coasts, rivers and lakes.

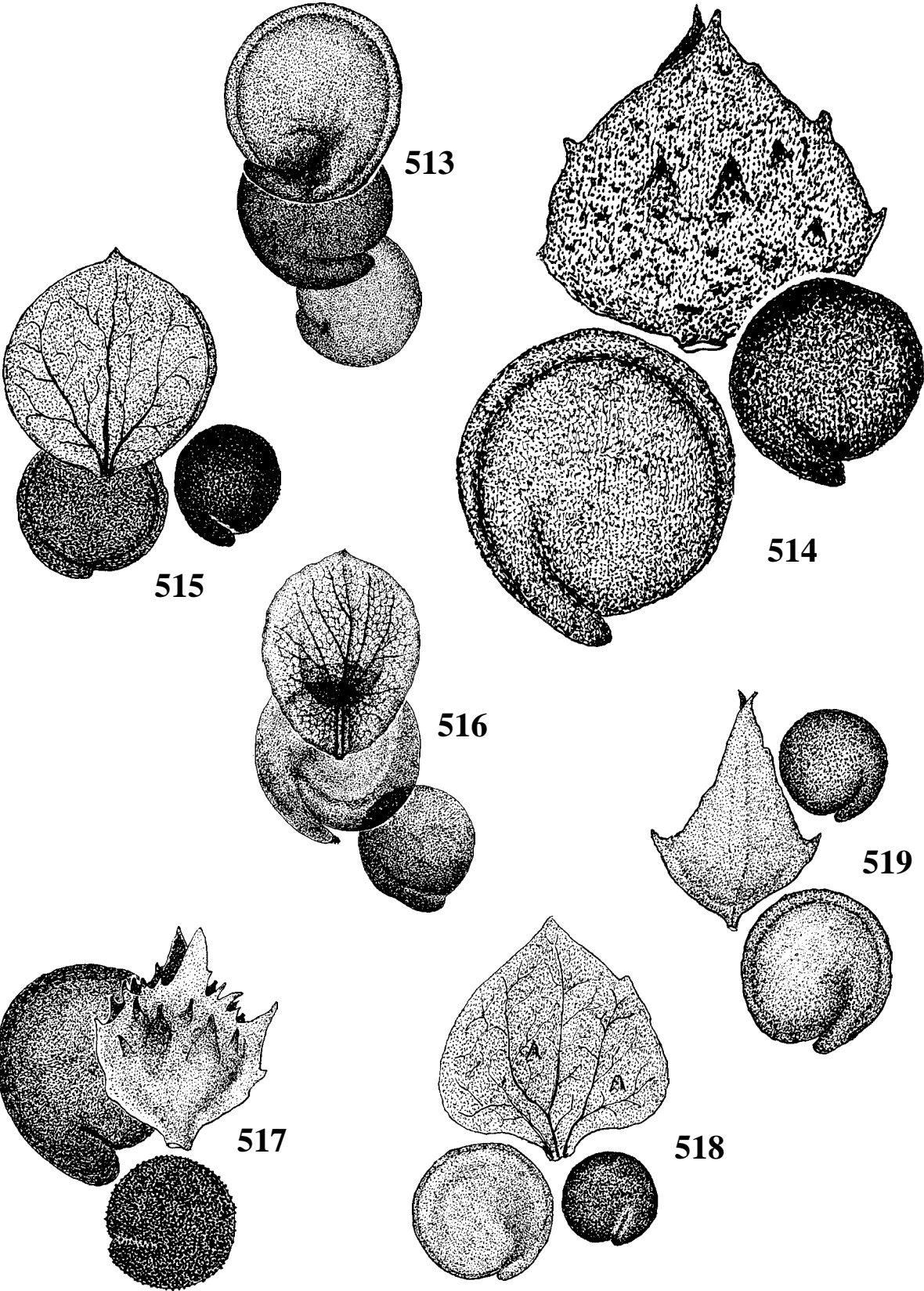
**516. *Atriplex hortensis*** L. — Annual, up to 250 cm high, stems erect, youngling farinose, glabrous ramified later on. Fruits utricles, pericarp free, tightly enclosed in the fruiting bracteoles, bracteoles round cordate, margin entire, terminate, 6-8 x 5-6 mm. Surface reticulate venous. Seeds of two types: those enclosed with bracteoles, brown, flattish, 2.3-4 mm in diam.; those enclosed within a perianth, black, smaller, only 1.4-2.2 mm in diam.; both orbicular.  $2n = 18$ . Native to central Asia; in Europe often cultivated as a vegetable; naturalized in the whole Carpathians, in gardens, orchards, waste places.

**517. *Atriplex littoralis*** L., *A. marina* L., *A. serrata* Huds. — Annual, up to 20-100 cm high, erect, much branched, stems sharply grooved. Fruits utricles, pericarp free, tightly enclosed in the fruiting bracteoles, rhombic-ovate, dentate, muricate, 4-5 x 3.5-4 mm. Seeds  $\pm$  spherical, lateral compressed, of two types: *larger*: smooth, dark-brown, lustrous, 1.8-2.3 mm in diam.; *smaller*: with papillae, lustreless, greyish-black 1.2-1.4 mm in diam.  $2n = 18$ . Originally to Eurasia, in seashores and inland saline places. Hu, Mo, Pl, Ro, Sk, Uk.

**518. *Atriplex oblongifolia*** Waldst. et Kit., *A. campestris* W. D. J. Koch et Ziz. — Annual, up to 120 cm high, stems stiffly erect, ramified from base. Fruits utricles, pericarp free, tightly enclosed in the fruiting bracteoles, triangular, apex acute, membranous, 4-4.4 x 3.6-4 mm. Seeds of two types; *larger*: dark-brown, lustrous, flattish, 2-2.5 mm in diam.; *smaller*: black, biconvex 1.3-1.7 mm in diam.  $2n = 36$ . Native to central-eastern and southeastern Europe, ruderal in saline sandy-soils. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**519. *Atriplex patula*** L., *A. agrestis* Schur, *A. angustifolia* Sm. — Annual, up to 30-150 cm high, stems much-branched, strongly sulcate, ascendent to erect. Fruits utricles, pericarp free, tightly enclosed in the fruiting bracteoles, broad rhombic, indistinct venous, 3.5-4 x 5.2-5.9 mm. Seeds spherical of two types: *flattened*: brown, 1.8-2.8 mm in diam.; *biconvex*: black, 1.4-2 mm in diam.  $2n = 36$ . Throughout Europe northwards to 71°N, weed in vegetable fields and waste lands, fallows, gardens, composts; in the whole Carpathians.





**520. *Atriplex polonica*** Zapł., *A. prostrata* subsp. *polonica* (Zapł.) Uotila — Annual, stems 50-80 cm high, branched from base, bare, leaves spear-arrow, dentate. **Seeds roundish, lateral compressed, radicle longer than the cotyledons, 1.3-1.5 mm in diam. Surface lustreless, greyish.** Native to central Europe, ruderal places. Pl, Sk (?).

**521. *Atriplex prostrata*** Boucher, *A. latifolia* Wahlenb. — Annual, stems crawling up to erect, 30-100 cm high, branched from base, twigs ascending, downy. **Fruits utricles, pericarp free, tightly enclosed in the fruiting bracteoles, 5.5-7 x 5-5.6 mm. Seeds roundish, lateral compressed having two sizes: smaller: greyish-black, 1.3-1.4 in diam. bigger: dark- to purplish-brown, 2.4-2.8 in diam.  $2n = 18$ .** Native to southern Europe; hauling into the Carpathian dumps, boundaries, riverbanks with loamy and saline soils. Mo, Ro, Sk, Uk.

**522. *Atriplex rosea*** L., *A. alba* Scop., *A. albicans* Besser, *A. besserianum* Schult. — Annual, glittery whitish or pinkish, lustrous, erect or ascendent, stems densely ramified, up to 100 cm high. **Fruits utricles, pericarp free, tightly enclosed in the fruiting bracteoles, rhombic, dentate, 3-5 x 3-5 mm. Seeds flattish, bright-brown or yellowish, 1.6-1.8 mm in diam. and biconvex dark-brown or red, 2-3 mm in diam.  $2n = 18$ .** Eurasian element, or rubbish stands, roads, fallows; in warmer areas of the whole Carpathians.

**523. *Atriplex sagittata*** Borkh., *A. acuminata* Waldst. et Kit., *A. nitens* Schkuhr. — Annual, 60-150 cm high, an erect green plant, farinose on beneath side of the leaf. **Seeds two types: bigger: flattish, pale-brown, 2-3 mm in diam. smaller: biconvex, black, 1.2-2 mm in diam.  $2n = 18$ .** An Eurasian species, often on dumps, waste grounds, roads; in warmest areas of Carpathians.

**524. *Atriplex tatarica*** L., *A. laciniata* L., *A. sinuata* Hoffm. — Annual, silverish, glittery whitish, lustrous, with ascending up to erect, stems 30-150 cm high. **Fruits utricles, pericarp free, tightly enclosed in the fruiting bracteoles, orbicular, reticulate venous, up to 7 mm. Seeds of two types: bigger: flattish, brown, 1.6-1.8 x 1.7-1.9 mm; smaller: biconvex, reddish-brown, 1.2-1.4 x 1.2-1.4 mm.  $2n = 18$ .** Native to Eurasia and North Africa, on railway stations, roadsides and waste places; on dry and warm areas of the Carpathians.

**525. *Halimione pedunculata*** (L.) Aellen, *Atriplex pedunculata* L., *Obione pedunculata* (L.) Moq. — Annual, up to 30-50 cm high, silver or greyish powdered, stems aslant erect or ascendent, ramified. **Fruits pseudocarpous, obtriangular, lateral lobes of apex long and spreading, 4.8-5.2 x 4.8-5.2 mm. Surface rough, venous, yellowish-white. Seeds elliptic or circular, flattish, biconvex, radicle ascendent, 2-2.5 x 1.8-2.2 mm. Surface smooth, lustrous, olive to greyish-brown.  $2n = 18$ .** Native to Eurasia, on sandy, steppe, saline grounds and seacoasts. Mo, Pl, Ro, Uk.

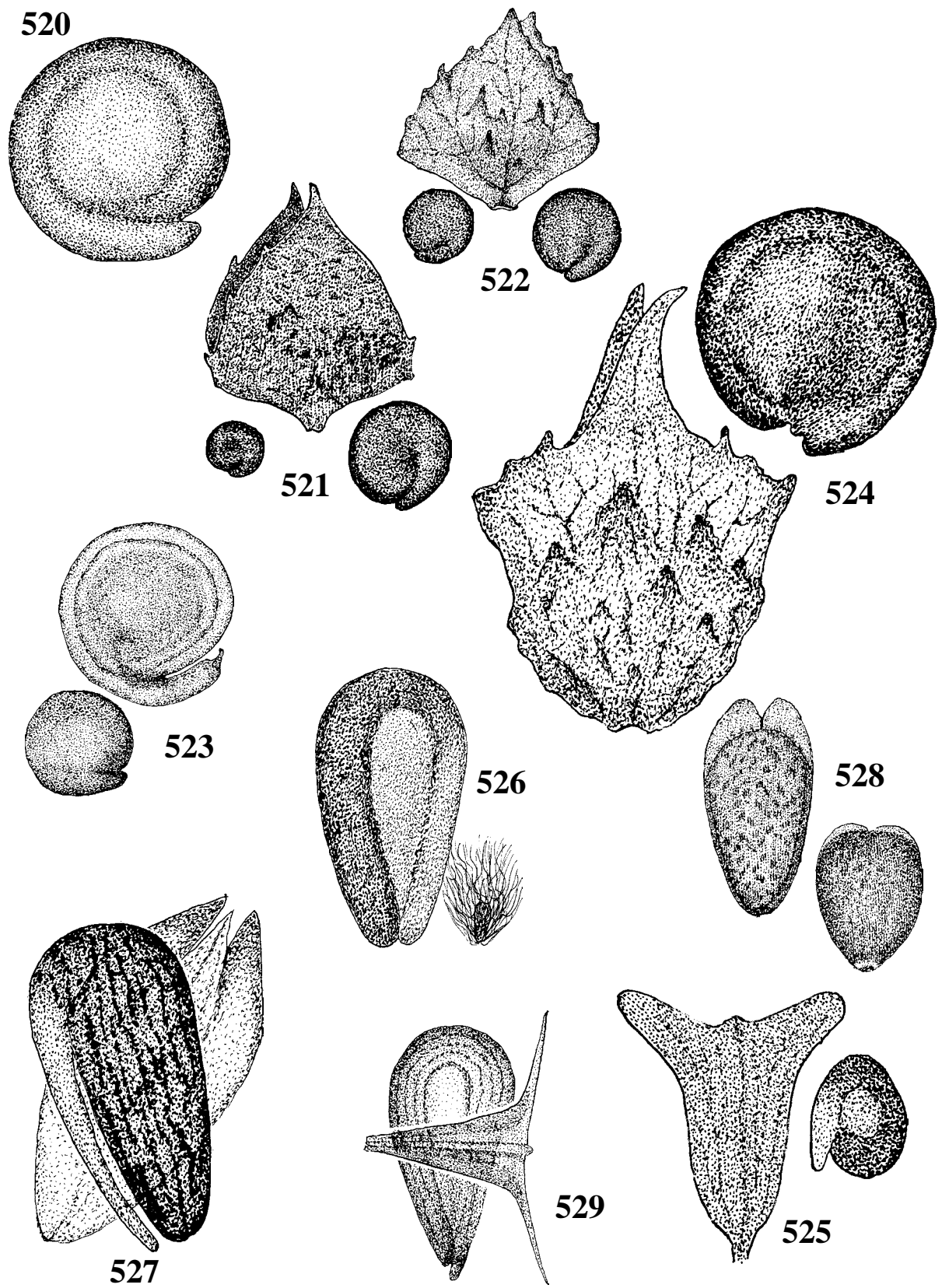
**526. *Ceratoides papposa*** Botsch. et Ikonn., *Eurotia ceratoides* (L.) C. A. Mey. — Perennial, subshrub up to 1 m high, stems erect or ascendent, tomentose or lanate, hairy, obovate, pubescent. **Fruits utricles enclosed by two bracts, bracts are 2 horned and covered by dense tufts of white hair. Seeds obovoid to horseshoe-shaped, radicle as long as cotyledons, but stronger, 2.7-3 x 1.4-1.6 mm. Surface dense pubescent, yellowish-brown.  $2n = 36$ .** Native to Eurasia, on sandy steppes, very local. Ro, Uk.

**527. *Camphorosma annua*** Pall., *C. ovata* Waldst. et Kit. — Annual or biennial, up to 5-50 cm high, downy or bare, with ascendent or erect stems. **Fruits utricles, perianth glabrous, 2.8-3.2 x 1.4-1.7 mm. Seeds prolonged oval, tip of the radicle free and long, 2.5-3 x 1.2-1.5 mm. Surface with prolonged trenches, grooved, smooth, dark-brown, radicle pale-brown.  $2n = 12$ .** Native in eastcentral Europe, extending to the Ukraine and Slovakia, in saline soils overflooded in spring, dried up in summer. Hu, Mo, Ro, Sk, Uk.

**528. *Axyris amarathoides*** L. — Annual, up to 15-80 cm high, with stellar hairs, pubescent. **Fruits utricles, heteromorphic, obovate or oval to cuneate, laterally compressed, pericarp adherent, winged, with distal 2-lobed appendage, 2.5-3 mm. Surface red or dark brown. Seeds prolonged obovoid or cordiform, winged at apex, 2-3.2 x 1.4-1.8 mm. Surface fine furrowed and hirsute, greyish with darker spots, wings dirty whitish.  $2n = 18$ .** Native to central Asia, rarely hauling with cereals or cotton into eastern Europe, naturalized on cultivated grounds and waste places.

**529. *Ceratocarpus arenarius*** L. — Annual, up to 40 cm high, stems erect or ascendent, dichotomic, ramified, hirsute to tomentose. **Fruits utricles, compressed, pericarp membranous, free from**





seed, bracteoles 5-7 mm long, connate, forming a triangular-cuneate involucre, faint hairy, long beaked on each side, 6-7 x 3.5-3.7 mm. Seeds prolonged cuneate or horseshoe-shaped, flattish, testa membranous, 1.2-1.5 x 0.6-0.8 mm. Surface parallel with margin wrinkly, brownish or dark-green, central part light greyish-yellow. Native to the Eurasian continent, on sandy, steppy and waste grounds, weed of cereals, roadsides. Mo, Ro, Uk.

**530. *Bassia hirsuta* (L.) Aschers., *Kochia hirsuta* (L.) Nolte** — Annual, up to 30-50 cm high, roughly hirsute, rarely glabrous, stems rounded, ramified from the base. **Seeds obovoid to lenticular, radicle  $\pm$  as long as cotyledons, 2-2.3 x 1.4-1.6 mm. Surface fine verrucose, smooth, lustreless, brownish to dark-brown.** Native to Eurasia, on sandy loess, saline and steppe grounds; rarely hauling into Carpathians. Ro, Uk.

**531. *Basia hyssopifolia* (Pall.) O. Kuntze, *Kochia hyssopifolia* (Pall.) Schrad.** — Annual, up to 100 cm high, hirsute or villous, erect, branches. **Seeds obovoid or horseshoe-shaped, flattish, radicle stronger than the cotyledons, 1.8-2.2 x 1.3-1.5 mm. Surface fine tuberculate, dull, dark-brown to nigrescent.  $2n = 18$ .** Native to eastern Europe, on saline soils and cultivated grounds. Mo, Uk.

**532. *Bassia laniflora* (S. G. Gmel.) A. J. Scott, *Kochia laniflora* (S. G. Gmel.) Borbás** — Annual, up to 10-40 cm high, stem simple or ramified, twigs ascendent, downy, reddish. **Fruits achenes, with persistent calyx, perianth pubescent, segments oval, obtuse, wings semicircular, erose, 3-4.5 mm long, 4.5-5.5 x 4.5-5.5 mm. Seeds obovoid to elliptic, embryo horseshoe-shaped, flattish, central part concave with the rest of the perianth, 1.7-2.2 x 1.4-1.7 mm. Surface smooth, dark-brown.  $2n = 18$ .** Native to Eurasia, in sandy, stony, steppy or dry saline soils, in the warmest lowlands. Br, Hu, Mo, Ro, Sk.

**533. *Bassia prostrata* (L.) A. J. Scott, *Kochia prostrata* L., *Salsola prostrata* L.** — Perennial, stems branched from the base, up to 80 cm high, shortly puberulent, reddish. **Fruits achenes with persistent calyx, hairy, perianth pubescent, segments oval, obtuse, wings semicircular, erose, 3-4.5 mm long, 5.5-6.5 x 5-6 mm. Seeds elliptic, smooth, embryo horseshoe-shaped, 1.7-2.2 x 1.4-1.7 mm. Surface strong, dark-brown.** Native to Eurasia, worth Africa, on sandy, stony steppy grounds, in dry salty soils, in the warmer lowland areas. Hu, Mo, Ro, Sk, Uk.

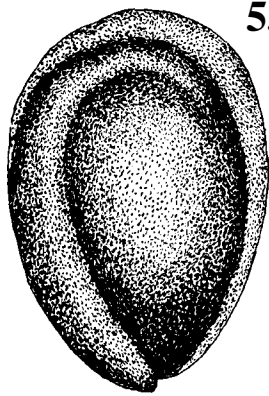
**534. *Bassia scoparia* (L.) A. J. Scott., *Kochia scoparia* (L.) Schrad.** — Annual, stems erect, branched, 20-150 cm high. **Fruits perianth covering achenes at maturity, compressed-spheric or compressed-elliptic, pericarp free or nearly so, membranous, wings rhomboidal, margin crenulatus, 3-4 mm long, 3-4 mm in diam. Seeds wedge-shaped, with a distinct radicle, 1.6-2 x 1.1-1.4 mm. Surface slightly ribbed, dark- to blackish-brown.** Originally growing in temperate Asia, naturalized in central, eastern and southern Europe, cultivated in gardens for its ornamental foliage; throughout the Carpathians.

**535. *Spinacia oleracea* L.** — Annual or biennial, stems erect up to 100 cm high. **Fruits achenes, elliptic-triangular, obovoid, biconvex, flattish, tip of the radicle slight projected, forming a slight marginal notch, 3-4 x 2.5-3.3 mm. Surface rough, lustreless, with an indistinct reticulum, orange-brown.  $2n = 12$ .** Originally growing in western Asia (?) or elsewhere; recently generally cultivated in the whole Carpathian territory as var. *inermis* (Moench) Metzg.; a vegetable with rich contents of vitamins and minerals.

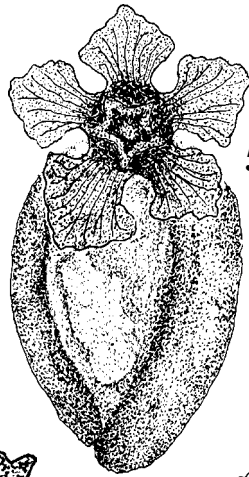
**536. *Corispermum intermedium* Schweig.** — Annual, up to 15-30 cm high, pubescent when young, stems smooth, dispersed hairy, green or reddish, branched. **Fruits achenes, elliptic-obovate, wing semimembranous, margin more or less entire, apex rounded with two small toothlets, 3.5-4 x 2.2-2.5 mm. Surface of the dorsal side rough warty, rest of the area faint verrucose, lustrous, greyish-brown, wing yellowish.** Native to northcentral Europe, on seashores and other sandy places. Pl.

**537. *Corispermum leptopterum* (Asch.) Iljin, *C. hyssopifolium* auct. non L.** — Annual, up to 10-60 cm high, hirsute, stems erect, seldom ascendent, ramified from the base. **Fruits achenes, ellipsoid to circular, flattish, dorsal side convex, ventral concave, apex with two small toothlets, wing semitranslucent, 3.2-3.6 x 2-2.5 mm. Surface faint verrucose, lustrous, greyish-brown.  $2n = 28$ .** Native to Eurasia, subruderal, on sandy roadsides, fallows, rubbish places, embankments, pine forests. Pl, Mo, Ro, Sk, Uk.

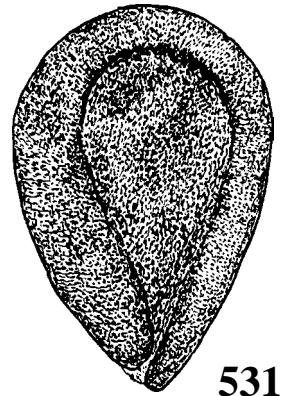
**538. *Corispermum marschallii* Steven, *C. canescens* subsp. *marschallii* (Steven) Dostál** — Annual, up to 30-60 cm high, stems simple, seldom branched, pubescent. **Fruits achenes, obovate or orbicular, flattish, erose, wings semitranslucent, with**



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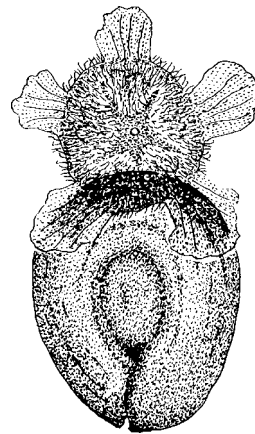
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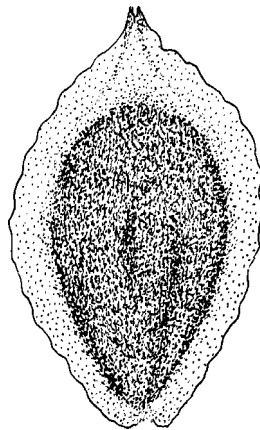
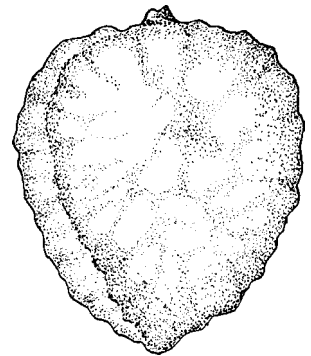


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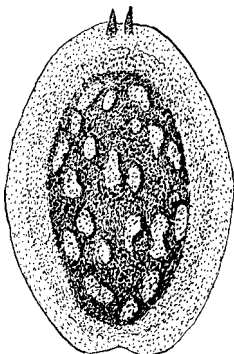


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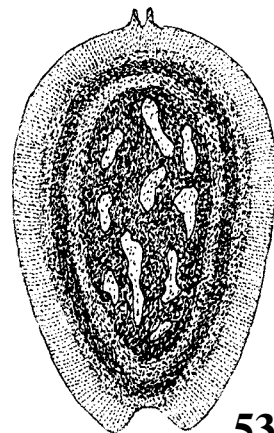
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two toothlets on the apex, 1-2 mm wide, 3.8-4.5 x 2.2-2.6 mm. Surface faint verrucose, slight lustrous, yellowish- to dark-brown.  $2n = 18$ . Native to central and southeastern Europe, in sandy soils of lowlands and uplands. Hu, Mo, Pl, Ro, Sk, Uk.

**539. *Corispermum nitidum*** Kit. ex Schult. — Annual, up to 10-50 cm high, dispersed hairy, branchlets, procumbent, reddish. Fruits achenes, oval or almost orbicular, flattish, apex truncate and short bidentate, wing thick, entire, 3.7-4.1 x 2.4-2.8 mm. Surface fine verrucose, lustrous, yellowish-brown.  $2n = 18$ . Native to central and eastern Europe up to the Caucasus, on a sandy steppes and as weed in cereals fields. Br, Hu, Mo, Ro, Sk, Uk.

**540. *Salicornia europaea*** L., *S. herbacea* (L.) L. — Annual or biennial, up to 10-40 cm high, erect or procumbent, simple to branched, poorly ramified, glaucous or grass-green, reddish above. **Seeds elliptic, lateral compressed, radicle as long as the cotyledons, 1.2-1.3 x 0.7-0.8 mm. Surface hairy, dull, brownish-green.  $2n = 18$ .** Native to Euro-Siberia, in saline soils drying up in summer. Hu, Mo, Pl, Ro, Sk, Uk.

**541. *Salicornia prostrata*** Pall. subsp. *simonkaiana* (Soó) Soó — Annual or biennial, up to 10-40 cm high, stems slender, procumbent or erect, simple to branched, grass- or yellow-green, reddish above. **Seeds elliptic, lateral compressed, radicle as long as the cotyledons or a little longer, 1.4-1.6 x 0.7-0.8 mm. Surface hairy, dull, brownish-green.  $2n = 18$ .** Native to the most part of eastern Europe, in saline and loamy-clayey soils of lowlands and uplands. Ro.

**542. *Suaeda maritima*** (L.) Dumort., *S. salsa* (L.) Pall., *Salsola maritima* M. Bieb. — Annual, up to 10-60 cm high, stems procumbent or erect, branchlets spreading, smooth, often reddish. **Seeds circular to reniform, biconvex, compressed, margin slight round, 1.5-2.2 x 1.5-2 mm. Surface with fine reticulate sculpturing, lustrous, brownish-black.  $2n = 36$ .** Native to southern Europe, in maritime, seldom continental saline soils. Hu, Pl, Ro, Uk.

**543. *Suaeda pannonica*** (Beck) Prain et al., *Schoberia pannonica* Beck — Annual, stems fine, 5-30 cm high, branched from the base, lower branchlets procumbent. **Seeds circular, biconvex, with a distinct projected radicle forming a marginal notch, sculpturing, 1.3-1.5 x 1.0-1.2 mm. Surface**

**reddish- to blackish-brown.** Native to the Pannonian region, on sandbanks of the warmer areas. Hu, Ro, Uk.

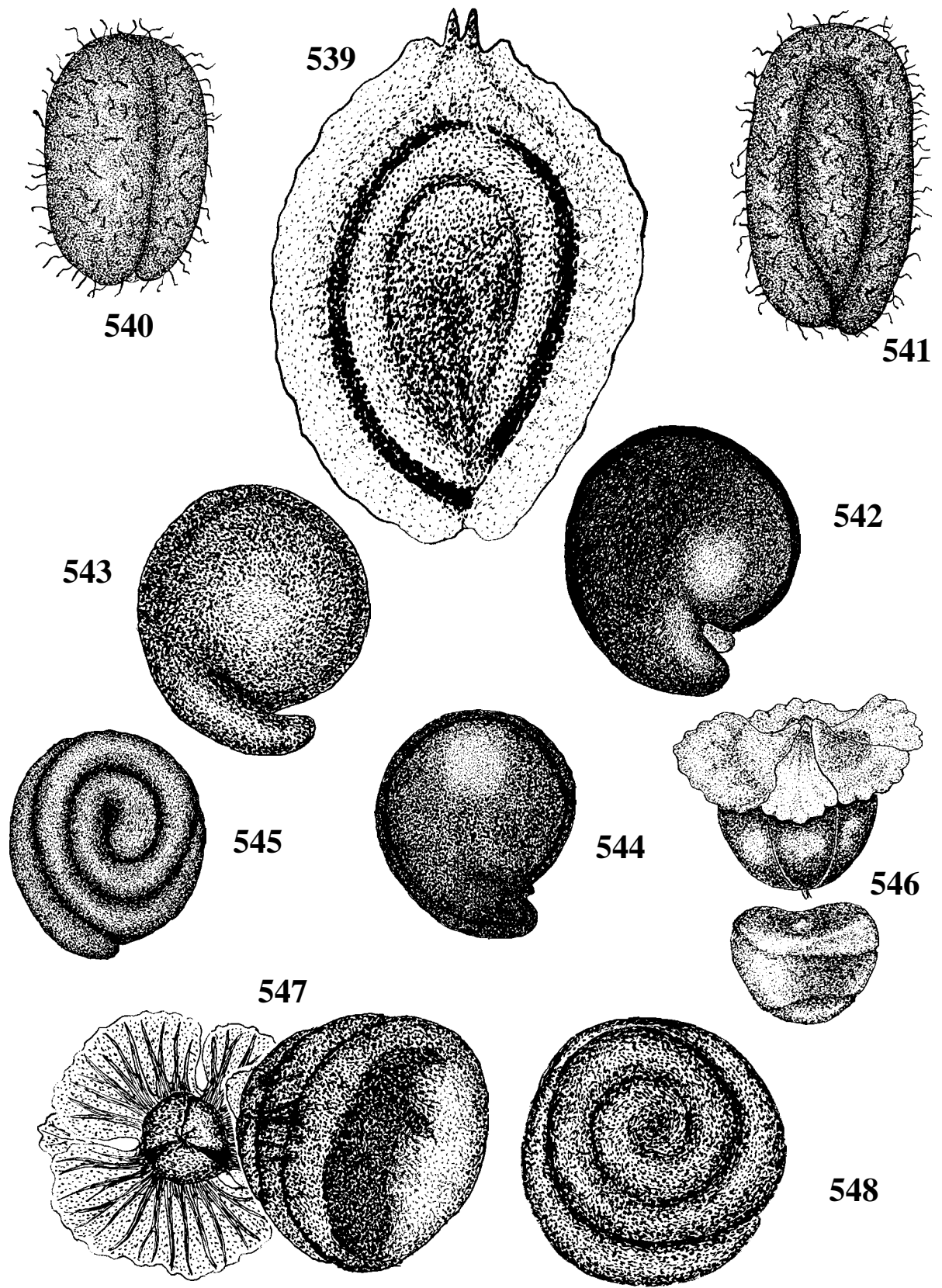
**544. *Suaeda splendens*** (Pourr.) Gren. et Godr., *Salsola splendens* Pourr. — Annual, up to 150 cm high, smooth, stems erect, much ramified. **Seeds circular to obovoid, biconvex, compressed, with a prominent projected tip of the radicle, 1-1.3 x 0.8-1.1 mm. Surface glossy, faint pitted, blackish-brown.  $2n = 18$ .** Originally growing in the Mediterranean, Asia Minor up to Siberia, northern Africa, in maritime saline soils. Ro.

**545. *Salsola collina*** Pall. — Annual, up to 15-60 cm high, stems erect, branchlets upright running out, yellow-red banded. **Seeds orbicular, wide turbinate-subsppherical, 1.6-2 x 1.2-1.5 mm. Surface coarse humped, greyish-brown, brown or black.  $2n = 18$ .** Native to temperate Asia, as a weed, rarely hauling into Europe, especially at railway stations, transloading places, waste grounds. Ro, Sk.

**546. *Salsola kali*** L. — Annual, up to 5-60 cm high, stems branched at base, smooth or bristly hairy, branchlets procumbent or erect. **Fruits utricles, perianth segments often connate with bracteoles, wings small, with an erose membranous margin or absent, 5.9-6.2 x 4.3-4.6 mm. Seeds near circular, turbinate-subsppherical, 2-3 mm in diam. Surface glabrous, lustrous, yellowish or greyish.  $2n = 36$ .** Eurasian herb, mostly on sandy shores and waste places as a weed. Hu, Pl, Ro, Sk.

**547. *Salsola ruthenica*** Iljin, *S. australis* R. Br., *S. kali* subsp. *ruthenica* (Iljin) Soó — Annual, up to 10-100 cm, stems erect or ascendent, branched from the base, glabrous or shortly hispid, greyish-green. **Fruits perianth covering utricles at maturity, perianth-segments oval, acuminate, usually with oval reniform wings, 7.0-8.5 mm in diam. (with wings). Seeds near circular with spiral-twisted germs, 1.8-2.2 mm in diam. Surface lustrous, blackish.  $2n = 36$ .** Throughout Europe northwards to 63°N, exclusively coastal in the north. Br, Hu, Mo, Sk, Uk.

**548. *Salsola soda*** L. — Annual, up to 70 cm high, stems ascendent or erect, branched, glabrous. **Seeds globular with oblique or horizontal twisted germs, 4-4.5 mm in diam. Surface lustrous, dark-brown.** Native to southern Europe, central Asia as far as China and Japan, on saline littoral marshes, meadows and steppes of temperate regions. Hu, Mo, Ro, Uk.



## 35. AMARANTHACEAE

**549. *Celosia argentea* L.** — Annual, up to 15-80 cm high, smooth, stems ramified. **Seeds circular or cylindrical, sublenticular, margin narrow, acute, 1.4-1.6 x 1.2-1.4 mm. Surface fine tuberculate, very lustrous, black. 2n = 36.** Originally growing in tropical America; widely cultivated in gardens, parks, flowerpots, frequently occurring as a causal in warmer areas of the Carpathians. Hu, Mo, Sk.

**550. *Celosia cristata* L.** — Annual, up to 10-40 cm high, stems erect, glabrous, furrowed. **Seeds pinched-reniform, obovoid or subglobular, sublenticular, without or with indistinct margin, 1.3-1.5 x 1-1.3 mm. Surface fine tuberculate, glossy, nigrescent to black. 2n = 36.** Native to tropical America; widely planted in gardens as a decorative summer plant, in the whole Carpathians. Mo, Sk, Uk.

**551. *Gomphrena globosa* L.** — Annual, up to 30 cm high, stems ramified at base, branchlets straight running out, knotted. **Seeds circular, elliptic, with expressive radicle and cotyledons, 1.4-1.6 x 1.1-1.3 mm. Surface slight lustrous, reddish-brown. 2n = 44, 48.** Place of origin tropical America. Often cultivated in gardens as an ornamental; in the whole Carpathians, rarely naturalized and temporary escapes. Hu, Mo, Sk, Uk.

**552. *Amaranthus acutilobus* Uline et Bray, *A. emarginatus* Salzm.** — Annual, stems procumbent or ascendent, richly leafy. **Seeds globular or ellipsoidal, compressed, biconvex, margin narrow, round, 1-1.3 x 1-1.2 mm. Surface smooth or faint verrucose, lustrous, nigrescent to black. 2n = 32.** Originally growing in Mexico; uniquely hauling into Europe and naturalized.

**553. *Amaranthus albus* L.** — Annual, up to 10-50 cm high, stems erect, leafy, procumbent or ascendent, glabrous, ramified. **Seeds circular, sublenticular, biconvex, acute at margin, 0.7-1 x 0.6-0.8 mm. Surface lustrous, smooth, blackish-brown to black. 2n = 32, 34.** Native to North America, naturalized in the Mediterranean and also in the warmer regions of the Carpathians; in fields, waste places, gardens, roadsides, domiciles, railway banks. Hu, Mo, Pl, Ro, Sk, Uk.

**554. *Amaranthus blitoides* S. Watson** — Annual, up to 15-50 cm high, whitish, glabrous or pubescent in the upper part, stems procumbent, ascendent, with red-coloured, spreading branched. **Seeds**

**circular, sublenticular, acute at margin, 1.4-1.6 x 1.3-1.5 mm. Surface glossy, black. 2n = 32.** Originally spread from central and western North America, naturalized, causal throughout most of Europe, on waste places, roadsides, domiciles in warmer areas. Br, Hu, Mo, Ro, Sk, Uk.

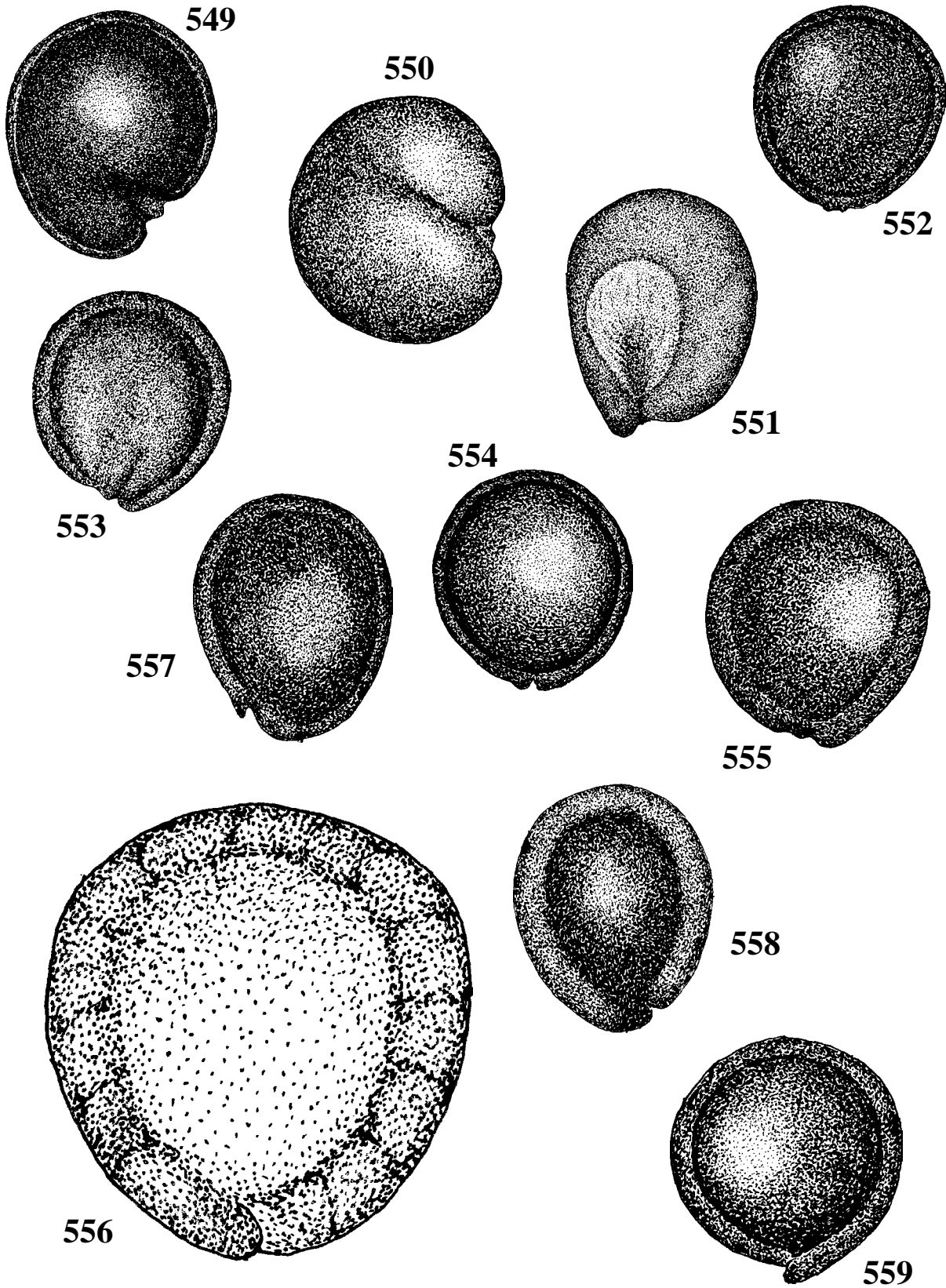
**555. *Amaranthus caudatus* L. var. *caudatus*** — Annual, up to 30-80 cm high, stems reddish, pubescent above, non or seldom ramified. **Seeds circular or obovate-circular, biconvex, compressed, 1.3-1.5 x 1.2-1.4 mm. Surface smooth, marginal list slight distinct and reticulate, glossy, black-brown (var. *caudatus*), or white and pink (var. *leucospermus*). 2n = 64.** Native to America; throughout Carpathians cultivated in flowerpots and gardens in some varieties as ornamental, temporary escapes.

**556. *Amaranthus caudatus* L. var. *leucospermus* (Wats.) Thell.** — Annual, very similar in appearance to the preceding var., **but with smaller seeds which are faint lustrous, radicle narrow, around whole cotyledons, 0.9-1.1 x 0.9-1 mm. Surface pink, cotyledons colourless. 2n = 32, 34.** Native in America; in the Carpathians frequently cultivated as an ornamental plant and occasionally naturalized in nature.

**557. *Amaranthus chlorostachys* Willd., *A. hybridus* L. subsp. *chlorostachys* (Willd.) Hejny, *A. hypochondriacus* L. subsp. *chlorostachys* (Willd.) Soó** — Annual, stems 30-100 cm high, much branched, weakly downy only above, leaves longly stalked, rhomboid-ovoid. **Seeds obovoid, lateral compressed, radicle shorter than the cotyledons, 1.1-1.3 x 0.9-1 mm. Surface lustrous, brownish-black. 2n = 32.** Native to tropical America, hauling into all Europe, in waste grounds and fields.

**558. *Amaranthus crispus* (Lesp. et Thévenau), N. Terracc.** — Annual, stems, procumbent, ascendent up to 40 cm high, densely leaved, puberulent. **Seeds obovate-globular, biconvex, with a relatively wide margin, 1-1.2 x 0.7-0.9 mm. Surface glabrous, reddish-black, lustrous. 2n = 34.** Originally spread from South America, naturalized, causal elsewhere in Europe, as weed in waste places, dumps, ports, near town and village communities. Hu, Ro, Sk, Uk.

**559. *Amaranthus cruentus* L., *A. paniculatus* L.** — Annual, up to 20-100 cm high, stems rough, slight pubescent above and together with leaves reddish or red, inflorescence usually dense. **Seeds circular or**



slight oboval, margin narrow, distinct, central part biconvex, 1-1.3 x 0.9-1.2 mm. Surface glossy, faint foveolate or glabrous, dark-chestnut to black or yellowish.  $2n = 32$ . Place of origin unknown; often cultivated in gardens as an ornamental plant in some cultivars, temporary escapes on waste grounds. Mo, Ro, Sk, Uk.

**560. *Amaranthus deflexus* L., *A. prostratus* Balbis** — Annual, up to perennial, stems up to 90 cm high, procumbent and ascendent, ramified, puberulent above. **Seeds obovate or elliptic, sublenticular, margin acute, 1-1.2 x 0.8-0.9 mm. Surface glossy, faint verrucose, nigrescent.  $2n = 34$ .** Place of origin South America, naturalized in southern Europe; hauling into the Carpathians, on roadsides, waste grounds and tilled lands. Hu, Mo, Ro, Sk, Uk.

**561. *Amaranthus dubius* Mart. ex Thell.** — Annual, stems erect, ramified, downy in the upper part. **Seeds subglobular, biconvex, compressed, margin rounded, 0.9-1 x 0.8-0.9 mm. Surface faint verrucose or smooth, glossy, dark-chestnut to nigrescent.  $2n = 64$ .** Originally growing in tropical America; uniquely hauling into waste places of the Carpathian territories.

**562. *Amaranthus graecizans* L., *A. angustifolius* Lam., *A. sylvestris* Vill.** — Annual, stem glabrous, erect or ascendent, up to 70 cm high, much ramified, partly reddish. **Seeds obovate or circular, lenticular, with more or less acute margins, 1.5-1.7 x 1.3-1.5 mm. Surface glabrous or faint verrucose, glossy, nigrescent to black.  $2n = 34$ .** Originally spread from America; naturalized in Europe and the Carpathians on waste grounds, in gardens, vineyards, roadsides, mainly in sandy soils. Hu, Pl, Ro, Sk, Uk.

**563. *Amaranthus hybridus* L.** — Annual, stems 20-100 cm high, erect, glabrous or sparsely pubescent above, leaves rhombic ovate, inflorescence often compound. **Seeds obovoid, vertical compressed, 1.1-1.6 x 0.9-1.2 mm. Surface smooth, glossy, dark-purplish.  $2n = 32$ .** Native to tropical and subtropical America; commonly introduced and naturalized in many parts of the Carpathians. Pl, Sk, Uk.

**564. *Amaranthus hypochondriacus* L., *A. chlorostachys* Willd. var. *erythrostachys* (Moq.) Aellen, *A. leucospermus* S. Watson** — Annual, stems erect, much branched, inflorescence deep-red. **Seeds  $\pm$  spherical, biconvex, lateral compressed, margin**

**slight acute, 1.3-1.4 x 1.1-1.2 mm. Surface smooth, lustrous, dark-purple.** Native to tropical America; widely cultivated in gardens as a summer-plant, rarely escapes. Hu, Ro, Sk, Uk.

**565. *Amaranthus lividus* L. emend. Thell., *A. ascens* Lois., *A. blitum* (L.) Kunth** — Annual, up to 80 cm high, stems erect or procumbent and ascendent, glabrous, sometimes reddish. **Seeds circular or oboval-circular, sublenticular, 1-1.4 x 0.9-1.2 mm. Surface with a very faint reticulum, the list smooth with distinct rounded lumina, plane, reflective, lustrous, black-brown.  $2n = 34$ .** Originally growing in tropical zones; often hauling into waste places, roads, fields, gardens, vineyards, as a weed throughout the Carpathians.

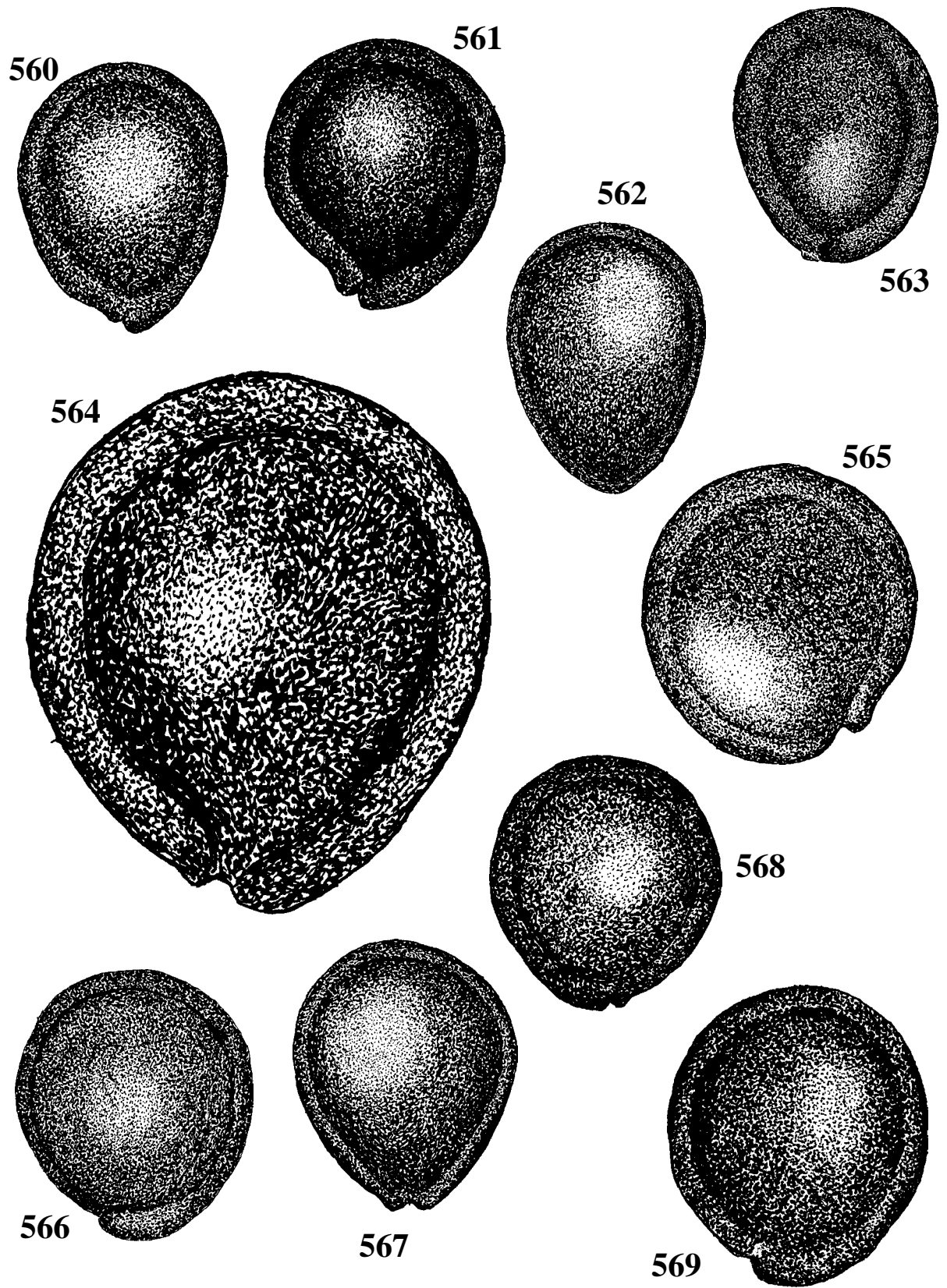
**566. *Amaranthus patulus* Bertol.** — Annual, stems 20-80 cm high, downy above. **Seeds broad obovoid, more or less lenticular, 1.3-1.5 x 1.1-1.3 mm. Surface smooth, glossy, dark purple to blackish.  $2n = 32$ .** Originally spread from South America, naturalized in southern Europe; uniquely hauling into waste places, fields fallows and dumps of the Carpathians. Hu, Ro, Sk, Uk.

**567. *Amaranthus powellii* S. Watson, *A. chlorostachys* auct. non Willd.** — Annual, up to 20-150 cm high, stems erect, much-branched, pubescent above. **Seeds obovate or circular elliptic, sublenticular, margin acute, 1.1-1.3 x 0.8-1 mm. Surface glabrous or faint verrucose, glossy, nigrescent to black.  $2n = 32$ .** Originally spread from tropical and subtropical America; hauling with imported material into temperate zones, as weed in fields, garden, in warmer areas. Hu, Ro, Sk, Uk.

**568. *Amaranthus quitensis* Kunth** — Annual, stems 30-60 cm high, much branched at base, inflorescence greyish-green or red. **Seeds  $\pm$  globular, more or less lenticular, margin acute, 1.2-1.3 x 1.1-1.2 mm. Surface smooth or faint verrucose, glossy, dark-purple.  $2n = 32$ .** Native to tropical America; rarely hauling into the Carpathians.

**569. *Amaranthus retroflexus* L., *A. apiculatus* Lam.** — Annual, up to 15-100 cm high, pale-green or reddish, stems sometimes ramified, densely short lanate above. **Seeds obovate, more or less lenticular, slight keeled, 0.9-1.1 x 0.8-0.9 mm. Surface smooth or faint verrucose, glossy, dark-chestnut to nigrescent.  $2n = 32, 34$ .** Native to North America, a cosmopolitan at present, on waste places, irrigated





fields and gardens, as weed from lowland to mountain zones; in the whole Carpathians.

**570. *Amaranthus spinosus* L.** — Annual, up to 100 cm high, stems erect, reddish to red, inflorescence downy. **Seeds obovate or circular, sublenticular, marginal list very narrow, 0.8-1.0 x 0.7-0.9 mm. Surface fine tuberculate, lustrous, reddish-black.  $2n = 64$ .** Place of origin probably tropical America, naturalized or temporary hauling mostly with cotton and oil seeds worldwide, inclusive the Carpathians.

**571. *Amaranthus tricolor* L., *A. melancholicus* L.** — Annual, stems ascendent or erect, up to 100 cm high, green or reddish. **Seeds globular or obovate, sublenticular, margin acute or slight rounded, narrow, 1.4-1.6 x 1.2-1.3 mm. Surface glabrous or faint verrucose, glossy, dark-chestnut.  $2n = 34$ .** Originally growing in tropical Asia, cultivated in gardens as an ornamental summer-plant, sometimes escapes.

### 36. POLYGONACEAE

**572. *Rumex alpinus* L., *Acetosa alpina* (L.) Moench** — Perennial, up to 50-200 cm high, rhizome creeping, stems erect, usually non-ramified. **Fruits achenes, trigonous, enclosed by the persistent perianth, lobes obtriangular, without tubercles, margin entire, 4-5 x 4-4.5 mm. Surface shining, brown to black. Seeds triangular, tapering to both ends, angles bowly vaulted, acute, 2.5-3 x 1.4-1.6 mm. Surface dark-brown.  $2n = 20$ .** An Eurasian element, on mountain meadows, especially in places of former sheep-farms, strongly nitrophillous, 750-1900 m. Pl, Ro, Sk, Uk.

**573. *Rumex aquaticus* L., *Lapathium aquaticum* (L.) Scop.** — Perennial, stems erect, 60-200 cm high, unramified. **Fruits achenes, trigonous, enclosed by the persistent perianth, lobes without tubercles, margin entire, 6-8 x 4-5 mm. Seeds elliptic-rhombic, sides plane, angles acute, keeled, apex rather gradually pointed, 2.7-3.5 x 1.3-1.7 mm. Surface high lustrous, glabrous, reddish-brown.  $2n = 140$ , c. 200.** Of Eurasian origin, on wet places near rivers, brooks, ponds, cooler upland and sub-montane zones; in the whole Carpathians.

**574. *Rumex confertus* Willd.** — Perennial, up to 40-100 cm high, stems erect, papillose-pubescent, weakly ramified. **Fruits achenes, trigonous, enclosed by the persistent perianth, obovate-cordate, margins dentate, without tubercles or**

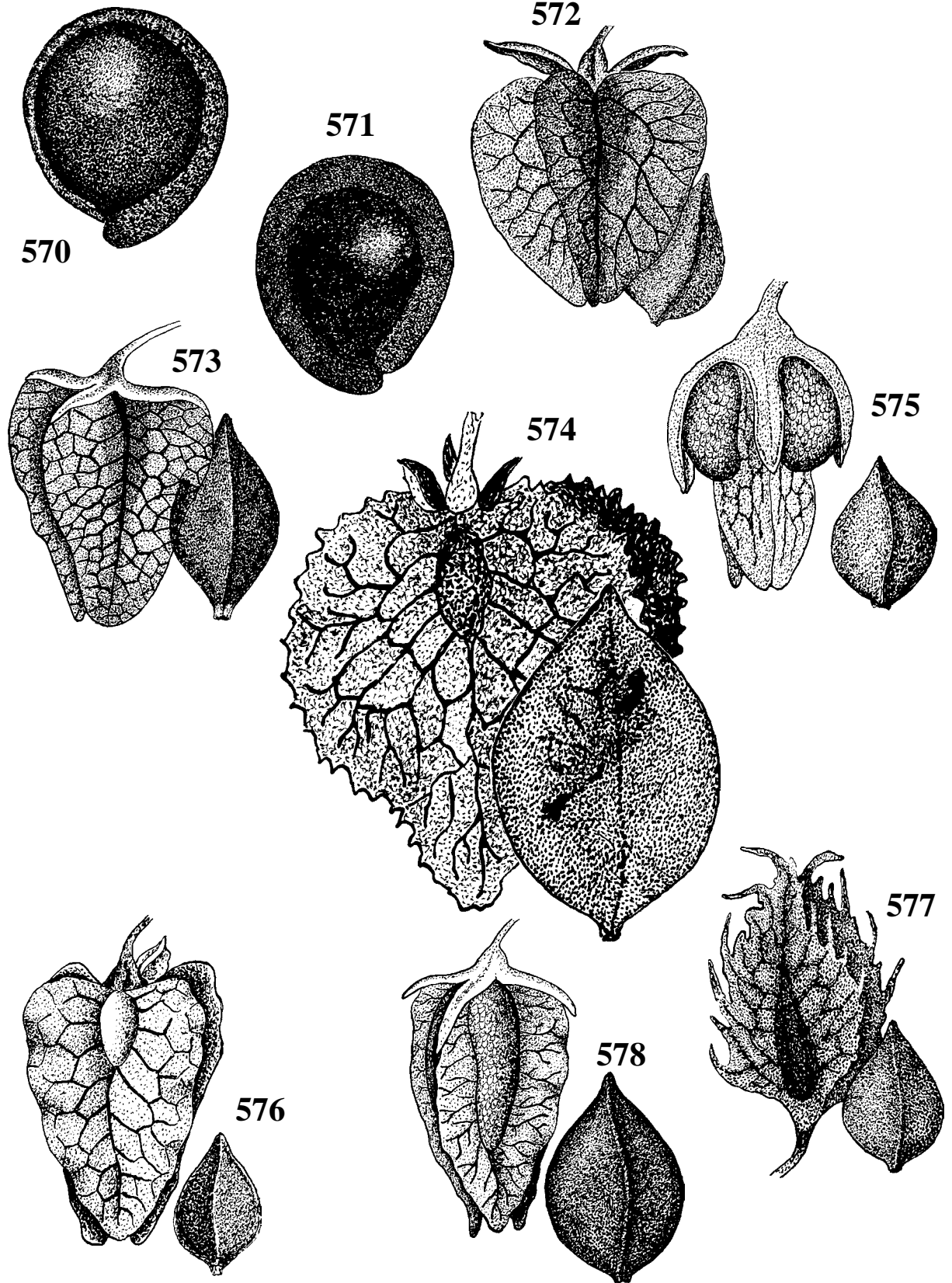
**small tubercle on one or two lobes, 6-6.5 x 6.5-7.5 mm. Seeds ovate-trullate or elliptic-rhombic, striptate, sides slight concave, angles acute, apex more elongated than the base, 2.7-3.3 x 1.8-2.2 mm. Surface lustrous, red-brown.  $2n = 38, 40, 60, 100$ .** Native eastern Europe and Asia; in the Carpathians on dryer meadows, forest clearings, mainly a ruderal. Hu, Mo, Pl, Ro, Sk, Uk.

**575. *Rumex conglomeratus* Murray, *R. acutus* Poirret** — Perennial, stems erect, much ramified, 30-100 cm high, often reddish. **Fruits achenes, broadest slightly below the middle, lobes obovate, each lobe tuberculated, margins entire, 3.2-3.8 x 2-2.3 mm. Surface dark brown. Seeds ovate, sides plane, angles not keeled, but fair acute, apex abrupt narrowing to point, 1.5-1.7 x 1.1-1.3 mm. Surface lustrous, red-brown to dark red-brown.  $2n = 20$ .** Native to Eurasia, on boundaries, ditches, riverbanks, weedy places along roads, light woodlands; in the whole Carpathians.

**576. *Rumex crispus* L.** — Perennial, stems erect,  $\pm$  unramified, 30-150 cm high. **Fruits achenes, trigonous, enclosed by the persistent perianth, broadest below the middle, lobes obovate-cordate, margins entire or undulate, each lobe tuberculate, one of them being usually larger, 5-6 x 3-4 mm. Surface brown. Seeds ovate, triangular, apex abrupt short-pointed, sides plane or slight convex, angles acute, 1.9-2.6 x 1.2-1.7 mm. Surface lustrous, dark purple-brown.  $2n = 60$ .** Originally growing in Eurasia, on seashores, river-gravels, in fields, boundaries, roadsides, and commonly as a ruderal, especially in villages; throughout the Carpathians.

**577. *Rumex dentatus* L.** — Annual or biennial, up to 20-70 cm high, stems ramified from the base, rarely simple. **Fruits achenes, trigonous, enclosed by the persistent perianth, lobes obtriangular, with one tubercle or without, margin prolonged dentate, 3.4-3.8 x 1.9-2.3 mm. Seeds elliptic-rhombic, angles acute, apex pointed, 2-2.2 x 1.3-1.4 mm. Surface slight, lustrous or dull, glabrous, brown.  $2n = 40$ .** Native to southeastern Europe as far as Asia Minor, on damp, marshy places. Hu, Ro, Uk.

**578. *Rumex hydrolapathum* Huds.** — Perennial, very robust, up to 200 cm high, with erect, angular stems. **Fruits achenes, trigonous, enclosed by the persistent perianth, with triangular valves, with a distinct fusiform tubercle each, 5-6 x 3.5-4 mm.**



**Seeds elliptic-rhombic, sides slight concave, angles acute, 2.8-3.2 x 1.8-2.1 mm.  $2n = 140$ , c. 200.** Originally growing in the most part of Europe, on marshes and along lakes, rivers and banks of water reservoirs, often in water; throughout the Carpathians.

**579. *Rumex kernerii* Borbás, *B. confertoides* Bih.** — Perennial, up to 40-150 cm high, stems erect, often ramified. **Fruits achenes, enclosed by the persistent perianth, lobes obtriangular or obovate-cordate, margins entire or undulate, with one prolonged tubercle, 4.7-5.3 x 3.7-4.3 mm. Seeds obtriangular or cordate, sides mostly plane, angles keeled, apex abrupt narrowing to a point, 2.6-2.8 x 1.7-1.9 mm. Surface lustrous, glabrous, brown.** Native to southern Europe (Balkan), on meadows, shrubberies. Hu, Ro.

**580. *Rumex longifolius* DC., *R. domesticus* Hartm.** — Perennial, stems 60-120 cm high, erect, stout. **Fruits achenes, trigonous, enclosed by the persistent perianth, lobes obtriangular, without tubercles, margins entire, 4.3-4.7 x 3.6-4 mm. Seeds ovate, apex gradually pointed, sides plane, angles keeled, 2.2-2.6 x 1.3-1.7 mm. Surface glabrous, lustrous, brown.  $2n = 60$ .** Native to northern and western Europe, rarely hauling into the riverbanks and damp places. Br, Pl, Ro, Uk.

**581. *Rumex maritimus* L., *R. aureus* Mill.** — Annual to biennial, stems ramified from the base, 20-70 cm high, mature plants gold-yellow. **Fruits achenes, trigonous, enclosed by the persistent perianth, lobes obtriangular, all tuberculate, margins with very fine capillary teeth, 2.5-3 x 1.5-2 mm. Seeds elliptic-rhombic, sides plane, angles acute, apex fairly gradually narrowed, 1.5-1.9 x 0.8-1 mm. Surface glabrous, lustrous, red-brown.  $2n = 40$ .** Originally an Euro-Siberian plant, on swampy banks of still-waters, ditches, discovered bottoms of rivers, in warmer areas; throughout the Carpathians.

**582. *Rumex obtusifolius* L., *R. sylvestris* Wall.** — Perennial, up to 120 cm high, stems branched, twigs slantingly patent, arcuate. **Fruits achenes, trigonous, enclosed by the persistent perianth, lobes obtriangular, with 3 tubercles, margin prolonged dentate, 6-7 x 3.5-4 mm. Seeds triangular, sides slight convex, apex gradually pointed, angles acute, keeled, 2.3-2.6 x 1.2-1.5 mm. Surface glabrous, lustrous, dark reddish-brown.  $2n = 40$ .** Native to Europe except the extreme north and south, on waste

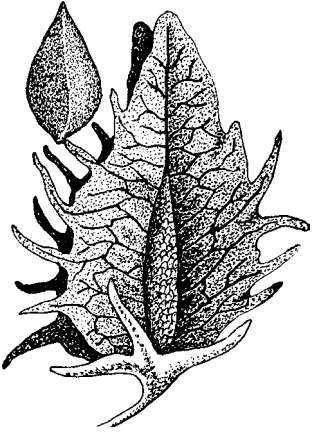
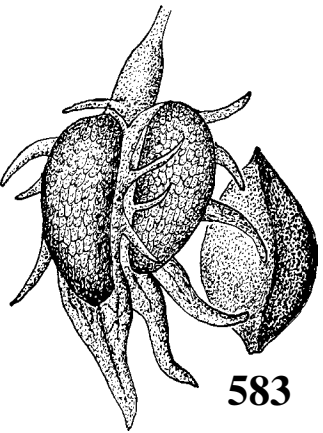
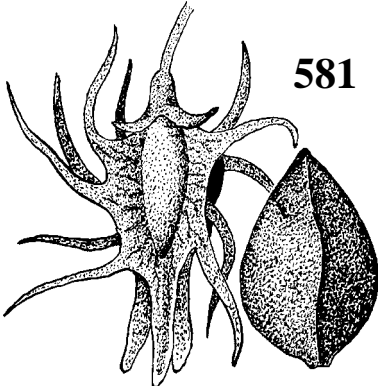
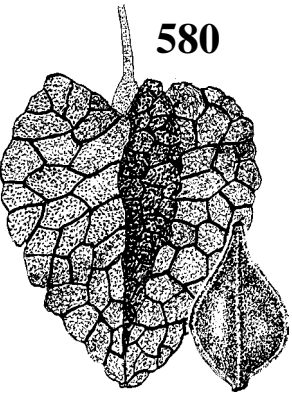
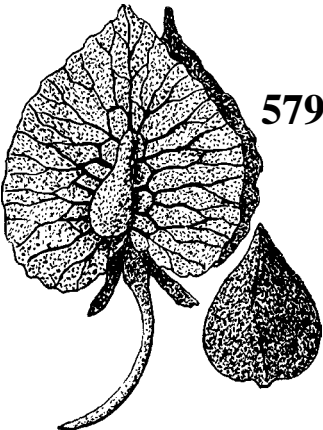
places, boundaries, fallows, fields margins, meadows, cut-over areas; in all Carpathian territories.

**583. *Rumex palustris* Sm., *R. limosus* auct. non Thuill.** — Annual to biennial, stems up to 60 cm high, erect, ramified, whole plant brown when having fruits ripe. **Fruits achenes, trigonous, enclosed by the persistent perianth, lobes obtriangular-obovate, each lobe tuberculate, margins with stiff bristle-like teeth, 3-4 x 1.2-1.5 cm (excluding teeth). Seeds elliptic-rhombic, sides plane, angles acute, apex abrupt narrowed, 2.2-2.4 x 1.1-1.3 mm. Surface glabrous, lustrous, red-brown.  $2n = 40$ .** Native to central and southern Eurasia, on marshes, muddy, swampy places, riversides, in warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

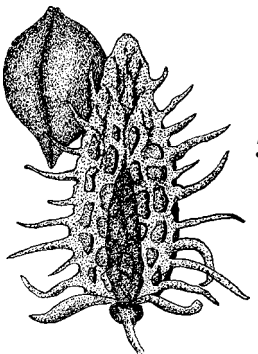
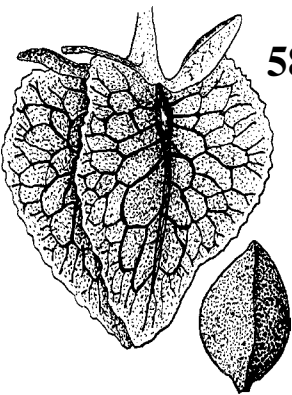
**584. *Rumex patientia* L., *R. recurvatus* Rech.** — Perennial, stems 80-120 cm high, robust, branched. **Fruits achenes, trigonous, enclosed by the persistent perianth, broadest below the middle, lobes obtriangular-cordate, one lobe tubercled, the others not or only minutely so, margins entire or undulate, 9.2-9.8 x 8.8-9.2 mm. Surface brown. Seeds oval-trullate, sides plane or slight concave, angles keeled, 4.2-4.8 x 2.3-2.6 mm. Surface barely lustrous, red-brown.  $2n = 60$ .** Native to Eurasia; cultivated as a vegetable in warmer areas, locally naturalized, at present mainly ruderal; throughout the Carpathians.

**585. *Rumex pseudonatronatus* Borbás, *R. domesticus* L. var. *pseudonatronatus* Borbás** — Perennial, stems stiff, erect, thin, 80-150 cm high. **Fruits achenes, trigonous, enclosed by the persistent perianth, lobes obovate-obtriangular, without or with only very small tubercles, margins entire or faint undulate, 6.4-7.4 x 5.5-6.2 mm. Seeds ovate, sides slight convex, angles acute, apex gradually pointed, 2.9-3.3 x 1.8-2 mm. Surface glabrous, lustrous, brown.  $2n = 40$ .** Native to Eurasia, on seashores and riversides, in inland saline soils. Br, Hu, Mo, Ro.

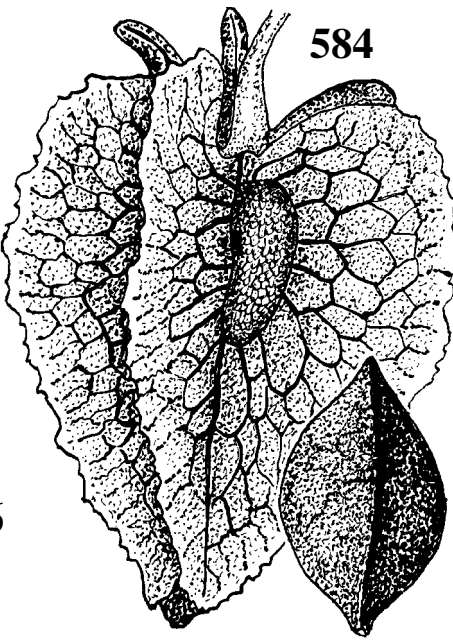
**586. *Rumex pulcher* L.** — Perennial, plant often papillose, stems ramified, rough, 20-60 cm high, ascendent, glabrous, grooved. **Fruits achenes, trigonous, enclosed by the persistent perianth, lobes obovate-obtriangular, each lobe tubercled, margins dentate, 4.5-5.2 x 3.2-4 mm. Seeds ovate, sides plane or slight concave, angles acute, apex gradually pointed, 2-2.3 x 1.5-1.7 mm. Surface lustrous, smooth, dark-brown.  $2n = 20$ .** Originally growing in southern and western Europe, a secondary



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cosmopolitan plant growing on damp places, roadsides, fields, waste grounds, mainly ruderal. Hu, Ro, Sk, Uk.

**587. *Rumex rugosus*** Campd., *R. ambiguus* Gren. — Perennial, stems up to 120 cm high, pale-green, with large leaves. **Seeds elliptic-rhombic, sides concave, angles acute, apex gradually narrowed, 2.5-3 x 1.4-1.6 mm. Surface glabrous, lustrous, dark purple-brown. 2n = 14 (female), 15 (male).** Place of origin unknown; in Europe cultivated as a vegetable in the past; in the Carpathians established here and there as an escape.

**588. *Rumex sanguineus*** L., *R. nemorosus* Schrad ex. Willd. — Perennial, stems erect, slender, simple or branched, 50-120 cm high, reddish later on. **Fruits achenes, biconvex, lobes unequal in size, one lobe with a globular tubercle, the others devoid of tubercles or with less developed tubercles, 2.2-2.4 x 2.2-2.4 mm. Seeds ovate, pointed, sides plane, angles acute, apex abrupt narrowing, 1.4-1.6 x 1-1.2 mm. Surface lustrous, dark-brown. 2n = 20.** Most of Europe, but rare in the Mediterranean region, on damp and shady places, open habitats. Br, Mo, Pl, Ro, Sk, Uk.

**589. *Rumex stenophyllus*** Ledeb., *R. odontocarpus* I. Sándor ex Borbás — Perennial, stems 50-120 cm high, similar to *R. crispus*. **Fruits achenes, trigonous, enclosed by the persistent perianth, lobes obtriangular, each lobe tubercled, margins with short, unequal teeth, 3.5-4.5 x 3.5-4.5 mm. Seeds elliptic-rhombic, angles acute, apex pointed, 2.9-3.3 x 1.7-1.9 mm. Surface lustrous, dark-brown. 2n = 60.** Originally growing in central and eastern Europe and western Asia, a halophilous plant on muddy grounds. Hu, Mo, Ro, Sk, Uk.

**590. *Rumex triangulivalvis*** (Danser) Rech. fil., *R. salicifolius* Weinm. — Perennial, stems furrowed, 30-100 cm high, erect, seldom ascendent. **Fruits achenes, trigonous, enclosed by the persistent perianth, lobes obovate-obtriangular, each with tubercle, rare on only one or two lobes, margins entire or fine denticulate, 3.2-3.8 x 2.5-3.0 mm. Seeds elliptic-rhombic, sides plane or slight concave, angles acute, apex abrupt narrowed, 1.9-2.2 x 1.2-1.4 mm. Surface lustrous, light-brown. 2n = 20.** Originally spread from North America, seldom hauling into railway stations and damps.

**591. *Rumex ucrainicus*** Fisch. ex Spreng. — Annual, stems simple or ramified, 10-15 cm high, branched from the base, slender. **Fruits achenes, biconvex, lobes obtriangular, one lobe with a large tubercle, the others with smaller, margins with very fine capillary teeth, 2.5-2.7 x 2.1-2.3 mm. Seeds elliptic, sides plane, angles acute, apex pointed, 1.2-1.4 x 0.7-0.9 mm. Surface lustrous, glabrous, orange-brown. 2n = 40.** Native to eastern Europe, on saline and sandy habitats, steppes, moist riversides and flooded meadows. Br, Mo, Pl, Ro, Uk.

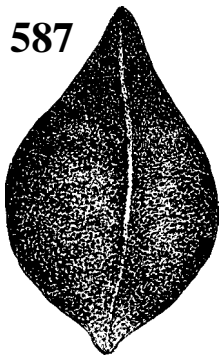
**592. *Acetosa arifolia*** (All.) Schur., *A. alpestris* non (Jacq.) Á. Löve, *Rumex arifolius* All., *R. carpaticus* Zapał. — Perennial, stems erect, 50-120 cm high, with rich foliage. **Fruits achenes, trigonous, enclosed by the persistent perianth, lobes elliptic-cordate, reticulately veinous, margins entire, 4-4.5 x 3-3.5 mm. Seeds ellipsoid-rhombic, sides plane, angles acute, keeled, 1.6-1.8 x 0.9-1.0 mm. Surface lustrous, dark-brown. 2n = 14 (female), 15 (male).** Native to the mountains of Eurasia, on moist meadows, swamps in *Pinus mugo* stands. Sk.

**593. *Acetosa scutata*** (L.) Mill., *Rumex scutatus* L. — Perennial, stems branched from the base, ascending, up to 60 cm high. **Fruits achenes, biconvex, lobes elliptic or elliptic-cordate, without tubercles, margins entire, lobes longer than seeds, 5-6 x 4.4-5 mm. Seeds elliptic-rhombic, angles acute, keeled, apex gradually pointed, 2.4-2.8 x 1.2-1.4 mm. Surface lustrous, orange. 2n = 20.** Native to mountains of central and southern Europe, on stony slopes, screes, hillsides, fields; sometimes cultivated as a vegetable and also in rock-gardens. Hu, Pl, Ro, Sk, Uk.

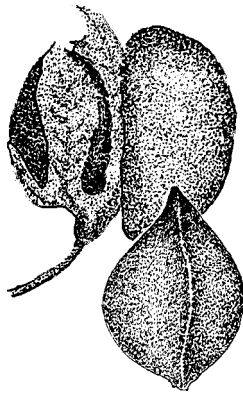
**594. *Acetosa tuberosa*** L., *Rumex tuberosus* L. — Perennial, some of the roots tuberous, stems ascendent, up to 100 cm high, smooth or papillate. **Fruits achenes, biconvex, lobes broader than longer, with a small tubercle at base, margins entire, lobes longer than seeds, 5.6-5.9 x 7-7.4 mm. Seeds elliptic, acuminate at the apex and narrowed at the bottom, angles acute, 2.2-2.6 x 1.1-1.3 mm. Surface weak lustrous, pale-brown.** Native to southern Europe, western Asia, on pastures, meadows with calcareous soils. Mo, Ro, Uk.

**595. *Acetosella angiocarpa*** (Murb.), Á. Löve, *Rumex angiocarpus* Murb. — Perennial, stems simple or ramified, 15-40 cm high, erect or ascendent, with a leaves rosette underneath. **Fruits achenes, broadly ovoid,**

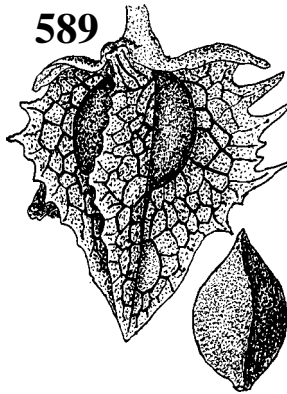
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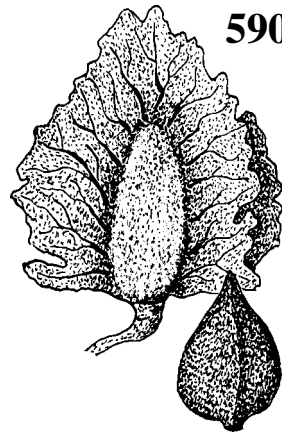
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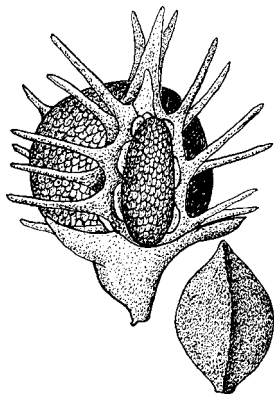
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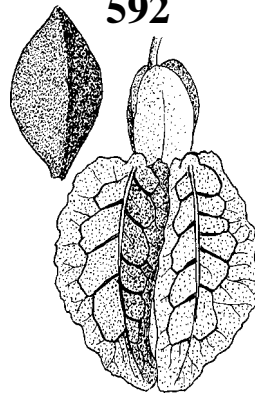
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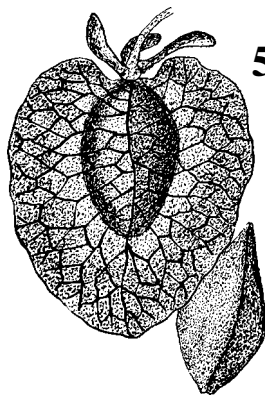
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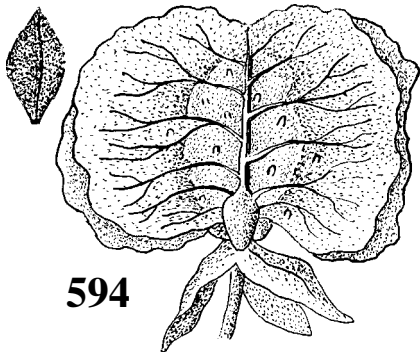
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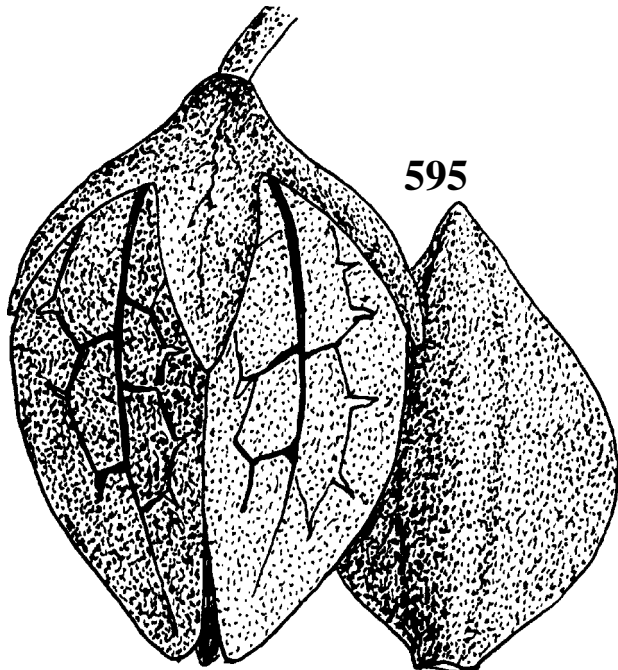
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trigonus, lobes triangular, reticulate venous, without tubercles, margin entire, adhering to the nuts, 1.6-2 x 1.2-1.4 mm. Surface shiny, brown or dark brown. Seeds, 1.3-1.5 x 1-1.2 mm. Surface lustrous, brown.  $2n = 14$ . Central and western Europe, the western Mediterranean region, on fallows, boundaries, poor pastures, sandbanks, seldom in fields. Sk.

**596. *Acetosella tenuifolia*** (Wallr.) Á. Löve, *Rumex tenuifolius* (Wallr.) Á. Löve — Perennial, stems ascending, often branched from below the half, flowering twigs ascending. **Fruits achenes, broadly ovoid, trigonus, lobes adhering to the seed, triangular, without tubercles, margins entire, lobes  $\pm$  as long as fruits, 1.6-2 x 1.3-1.5 mm. Seeds elliptic-rhombic, sides slight concave, angles obtuse, 1.3-1.5 x 0.9-1.1 mm. Surface glabrous, lustrous, reddish-brown.  $2n = 28$ .** Native to Eurasia, on stony banks of brooks, on wet rocky and sandy pastures, on calcium-poor soils. Ro, Sk.

**597. *Acetosella vulgaris*** Fourr., *Rumex acetosella* var. *vulgaris* V. D. J. Koch — Perennial, up to 70 cm high, erect or ascending, branching at or above the middle. **Fruits achenes, broadly ovoid, trigonus, with triangular lobes adhering to the seed, without tubercles, margins entire, lobes  $\pm$  as long as seeds, 1.4-1.8 x 1.1-1.3 mm. Seeds rhombic, angles obtuse, sides concave, 0.9-1.4 x 0.7-0.9 mm. Surface glabrous, lustrous, brown.  $2n = 42$ .** In most countries of Europe, on fallows, boundaries, sandy stands, screes, rocks, in fields and waste places, calcifuge, from lowlands up to the subalpine zone; throughout the Carpathian territories.

**598. *Oxyria digyna*** (L.) Hill, *Rumex digynus* L. — Perennial, tiny, glabrous, simple, ascendent, stems up to 10-30 cm high. **Fruits achenes, a strong compressed, broad winged, enclosed within perianth lobes, 3-4.5 x 3.3-4.6 mm. Seeds pyriform shaped, corpus slight biconvex, base cuneate, apex pointed, 1.5-1.7 x 0.8-1 mm. Surface bare lustrous, orange-yellow or brown-red.  $2n = 14$ .** Native to arctic Europe, and all the main mountain-ranges, on rocky slots and stony riverbanks, calcifuge. Pl, Ro, Sk, Uk.

**599. *Rheum officinale*** Baill. — Perennial, a plant up to 3 m high, very similar to *R. rhubarbarum*. **Fruits achenes, oblong-ellipsoid, three winged, wings c. 3 mm wide, with longitudinal veins near margin, 8-9 x 7-8 mm.  $2n = 22$ .** Native to Asia (Tibet); culti-

vated as a medical plant for its voluminous roots, and also as an ornamental in gardens and parks. Hu, Ro, Sk.

**600. *Rheum palmatum*** (L.) — Perennial, stems 1 to 2 m high, also a plant very similar to *R. rhubarbarum*. **Fruits achenes, oblong-ellipsoid, three winged, wings c. 3 mm wide, with longitudinal veins near margin, larger than in previous species, 8-10 x 7-9 mm.  $2n = 20$ .** Native to western China; in the Carpathians seldom cultivated as an ornamental perennial plant for its decorative foliage, as well as voluminous roots utilized in medicine as a purgative. Hu, Ro, Sk, Uk.

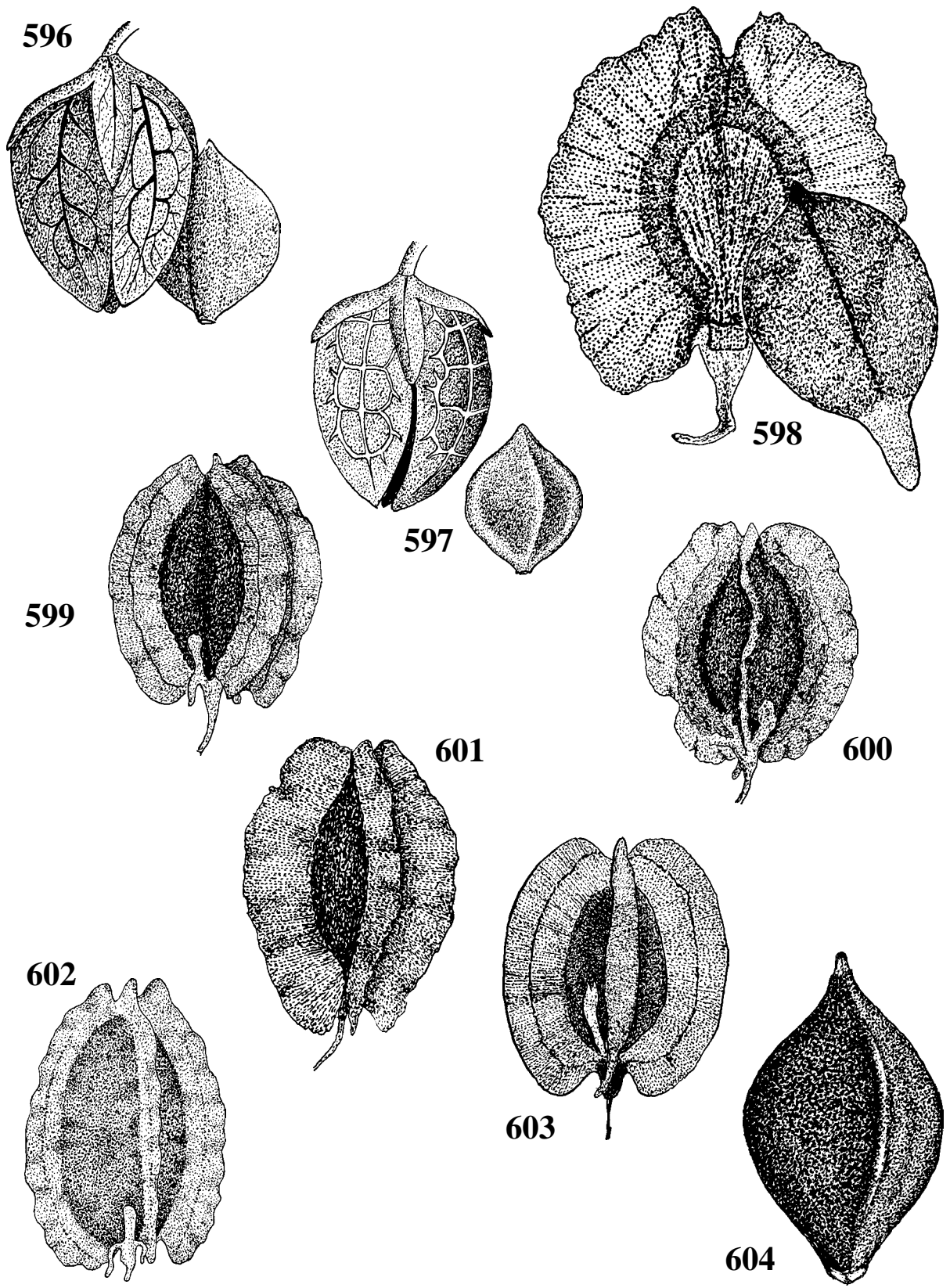
**601. *Rheum rhubarbarum*** L., *R. undulatum* L. — Perennial, up to 2 m high, very thick (up to 5 cm) stems and also thick petioles (up to 2-3 cm). **Fruits achenes, one-seeded, trigonus, with angles usually distinct winged, wings submembranous, radial striate, 9-10 x 6-8 mm. Surface lustrous, vitreous, transversal slight wrinkly or dimply, wings brown or henna.  $2n = 44$ .** Native to Mongolia and the neighboring territories; in Europe cultivated for its edible petioles and a decorative foliage. Br, Hu, Ro, Sk.

**602. *Rheum rhaponticum*** L. — Perennial, stems 100-150 cm high, likewise the previous species having its habits very similar to *R. rhubarbarum*. **Fruits achenes, 1-seeded, trigonus, with submembranous wings, wings margin undulate, 7-10 x 5-8 mm.  $2n = 44$ .** Native to Bulgaria on wet mountain rocks; cultivated in gardens and parks as an ornamental and also a culinary herb. Hu, Ro, Sk, Uk.

**603. *Rheum tataricum*** L. fil. — Perennial, stems stout, inclined, bearing a single leaf each. **Fruits achenes, 1-seeded, trigonus, angles being distinct radially striate winged, wings margin entire, submembranous three-winged testa strong connected with slight lustrous seeds, 7.5-8.5 x 6-8 mm. Surface central part dark-purple, wings reddish-brown.** Native to central Asia, on dry, open places; rare cultivated in the eastern Carpathians. Mo, Uk.

**604. *Bistorta major*** Gray, *B. officinalis* Raf., *Polygonum bistorta* L. — Perennial, stems erect, 30-100 cm, undershoots rough and undulated. **Seeds trigonus, elliptic-rhombic, ends narrowed on both sides, angles bowly vaulted, obtuse, apex pointed, base rounded, 3.4-4 x 2-2.6 mm. Surface shining, glabrous, lustrous, dark-brown.  $2n = 44, 46, 48$ .**





Native to Eurasia, on moist to peaty and alpine meadows, neutral up to acidic soil. Br, Hu, Pl, Ro, Sk, Uk.

**605. *Bistorta vivipara* (L.) Gray, *Polygonum viviparum* L.** — Perennial, a tender plant, with erect 5–40 cm high stems. The reproduction is usually vegetatively effected by bulbils of mushroom appearance. **Seeds biconvex, the upper part rounded, 2.4–2.8 x 1.3–1.7 mm. Surface glabrous, shining, wrinkly, the upper part brownish-red to dark brown, the bottom part yellowish-green.  $2n = c.$  66.** Native to the circumpolar zones, on mountain meadows, pastures in the Carpathians. Pl, Ro, Sk.

**606. *Persicaria amphibia* (L.) Delarbre, *Polygonum amphibium* L.** — Perennial, this species has two forms: terrestrial and aquatic. The first being about 60 cm high, the latter about 100 cm. **Fruits dry achenes enclosed by persistent perianth, 3-angled, elliptic, biconvex, lateral view flattish, apex apiculate by a style-rest, 2.3–2.8 x 1.8–2.2 mm. Surface glabrous, slight rough, bare lustrous, dark to black-brown.  $2n = 66, 96.$**  Native to Eurasia, North America, in damp fields, trenches, slowflowing rivers and their banks; throughout the Carpathians.

**607. *Persicaria hydropiper* (L.) Delarbre, *Polygonum hydropiper* L.** — Annual, glabrous, stems erect or ascendent, 20–80 cm high. **Fruits dry achenes enclosed by persistent perianth, ovoid, lateral view planoconvex, apex somewhat at abrupt pointed, base slight tapering, 2.6–3 x 1.5–2 mm. Surface rough with a fine sculpture, bare lustrous, dark- to black-brown.  $2n = 20, 22.$**  Native to Europe, Siberia, the Caucasus, on meadows, moist forest roads, damp and overflowed places and fields; throughout the Carpathians.

**608. *Persicaria lapathifolia* (L.) S. F. Gray, *Polygonum lapathifolium* L., *P. hypanicum* Klovov, *P. nodosum* Pers.** — Perennial, stems procumbent or ascendent to erect, simple or ramified, sometimes red-spotted. **Fruits dry achenes, elliptic to ovoid, apex short-pointed, base often with stipe-like perianth-rest, sides concave, 2–3 x 1.5–2.5 mm. Surface smooth or slight rough, barely lustrous, dark- to black-brown.  $2n = 22.$**  Cosmopolitan, on overflowed riverbanks, trenches, denuded pool bottoms, alluvial meadows, sometimes in shallow waters.

**609. *Persicaria maculosa* Gray, *P. mitis* Delarbre, *Polygonum persicaria* L.** — Annual, up to 20–60 cm

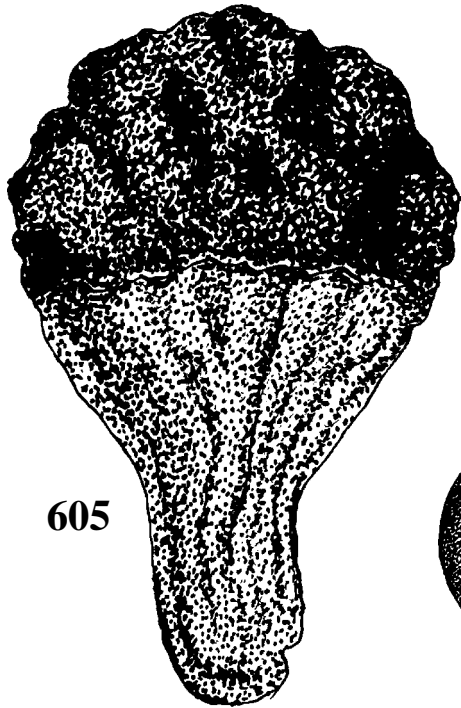
high, stems erect or ascendent, tender, simple or branched. **Fruits dry achenes enclosed by persistent perianth, blunt triangular, lenticular, apex narrow pointed, 2.5–3.5 x 1.8–2.1 mm. Surface lustrous, glabrous, pale- to dark-brown.  $2n = 40, 44.$**  Originally growing in Europe except the north, on damp forest roads, denuded places near water streams, damp places, from lowlands to uplands; throughout the Carpathians.

**610. *Persicaria minor* (Huds.) Opiz, *Polygonum minus* Huds.** — Annual, stems glabrous, slender, procumbent to erect, 10–40 cm high. **Fruits dry achenes enclosed by persistent perianth, elliptic-rhombic, flattish, biconvex, transversal section elliptic, rarely trigonous, apex acuminate, base obtuse, 1.4–2 x 1–1.4 mm. Surface lustrous, glabrous, dark-brown to black.  $2n = 40.$**  Temperate zone of Eurasia, on damp places, overflowing pond banks, ditches, moist fields, meadows and roads; in the whole Carpathians.

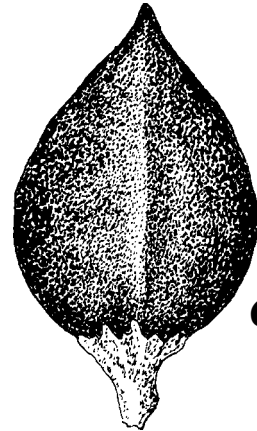
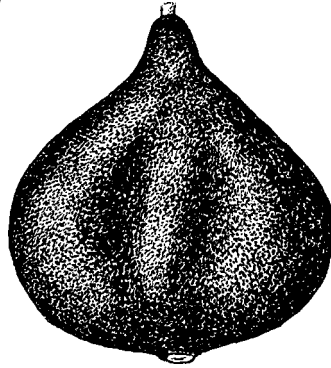
**611. *Persicaria mitis* (Schrank) Opiz ex Asenov, *Polygonum mite* Schrank, *Persicaria laxiflora* Opiz** — Annual, stems 10–60 cm high, erect, thin, leaves ellipsoid-lanceolate. **Fruits dry achenes enclosed by persistent perianth,  $\pm$  roundish, lateral flattish, apex narrowed into a beak, bottom  $\pm$  truncate, 2.6–3 x 1.8–2 mm. Surface fine punctulate, lustrous, brown to blackish-brown.  $2n = 40, 44.$**  Native to Europe and the Caucasus, stripped bottom of the ponds, overflowed riverbanks, ditches, wet woody ways, in warmer lowland regions; in the whole Carpathians.

**612. *Persicaria orientalis* (L.) Vilm., *Polygonum orientale* L.** — Annual, stems up to 100 cm or higher, erect, ramified, densely pubescent. **Fruits dry achenes enclosed by persistent perianth, broad ovate, elliptic, flattish, slight biconvex, transverse section elliptic, margin with circumference furrow, apex short pointed, 2.6–3.3 x 2.8–3.4 mm. Surface shiny, slight lustrous, fine granular, brownish-black.  $2n = 22, 24.$**  Native to China, seldom cultivated in orchards, flowerpots, gardens and parks, locally naturalized. Hu, Pl, Ro, Sk, Uk.

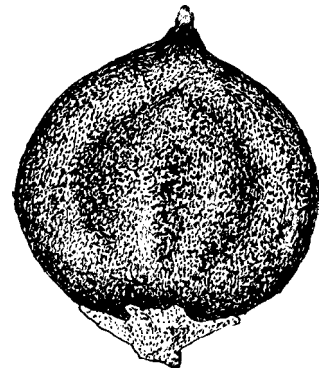
**613. *Polygonum affine* Don.** — Perennial, densely caespitose, stems up to 20–25 cm high, with pink up to reddish flower spikes, throughout the year tufts change their colour from light green in spring to yellow, red, up to honey brown in winter. **Fruits achenes with sepals, elliptic, trigonous with short**



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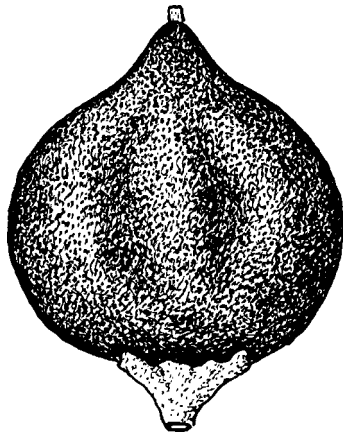


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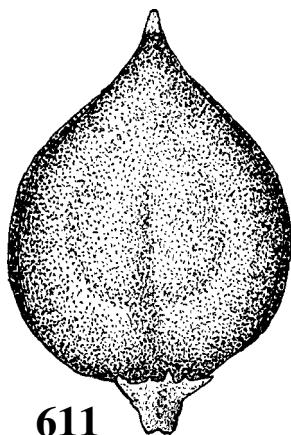
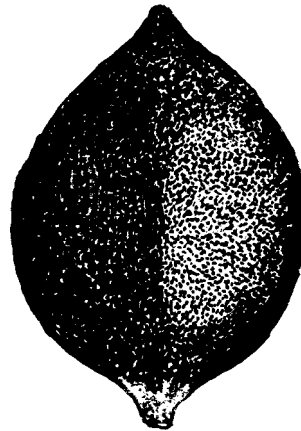


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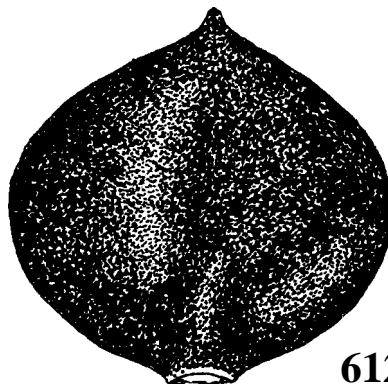
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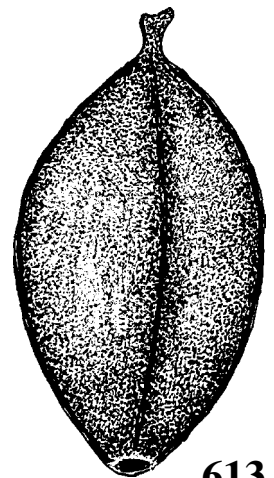
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beak at the apex, hilum at the bottom rounded, depressed, 2.5-2.7 x 1.3-1.4 mm. Surface glabrous, lustrous, dark-brown. Native to the Himalayas, often cultivated in rock-gardens as an attractive plant.

**614. *Polygonum alpinum*** All., *P. undulatum* Murray – Perennial, stems erect, 30-80 cm high, ramified, glabrous, slight pubescent. **Fruits achenes with sepals, ovate, three-sided, apex pointed, slight exerted from perianth, 3.5-4 x 2.5-2.9 mm. Surface slight lustrous, glabrous, light-brown. 2n = 20.** An Eurasian mountain plant, on slopes and screes, from 100 to 2000 m elevation, on calcareous substances. Ro, Uk.

**615. *Polygonum arenarium*** Waldst. et Kid. – Annual, stems procumbent or ascending, diffusely branched from the base, 20-50 cm high. **Fruits achenes with sepals, trigonous to ovate, transverse section triangular, apex gradually pointed, 2.3-2.7 x 1-1.4 mm. Surface glossy, sides concave, dark-brown. 2n = 20.** Pannonian endemic growing in central Europe, especially on sandbanks, forest steppes and tilled grounds. Hu, Ro, Sk, Uk.

**616. *Polygonum arenastrum*** Boreau, *P. aequale* Lindm. – Annual, stem procumbent or crawling, scarcely ramified from the base, up to 30 cm long. **Fruits achenes with sepals, trigonous, ovate, narrowed on one side, apex gradually pointed, 2.7-3 x 1.5-1.7 mm. Surface with expressive low tubercles, slight lustrous, dark-brown. 2n = 40.** Origin unknown, on roadsides, waste places, slopes; throughout the Carpathians. Mo, Ro, Sk, Uk.

**617. *Polygonum aviculare*** L., *P. heterophyllum* Lindm. – Annual, stems erect or procumbent, 10-50 cm long, ramified, glabrous. **Fruits achenes with sepals, trigonous to ovate, transverse section triangular, apex successive pointed, 2.8-3.2 x 1.8-2 mm. Surface rough, punctate or striate, bare lustrous or dull, dark-brown to nigrescent. 2n = 60.** Place of origin Eurasia, secondary cosmopolitan, everywhere in surrounding of human dwellings, waste places, shrubberies, fallows, lawn margins; in the whole Carpathians.

**618. *Polygonum bellardii*** All., *P. patulum* subsp. *kitaibelianum* (Sadler) Aschers. et Graebn. – Annual, stems erect, slender, ramified, 20-100 cm high. **Fruits achenes with sepals, ovate with the rest of the perianth, transverse section trigonous, apex acuminate, 2.4-2.6 x 1.2-1.4 mm. Surface minute punctuate,**

**shining, dark-brown. 2n = 20.** Native to southern and central Europe, Asia Minor, Arabia on dry steppe slopes, sandy and stony soils, ruderal. Mo, Uk.

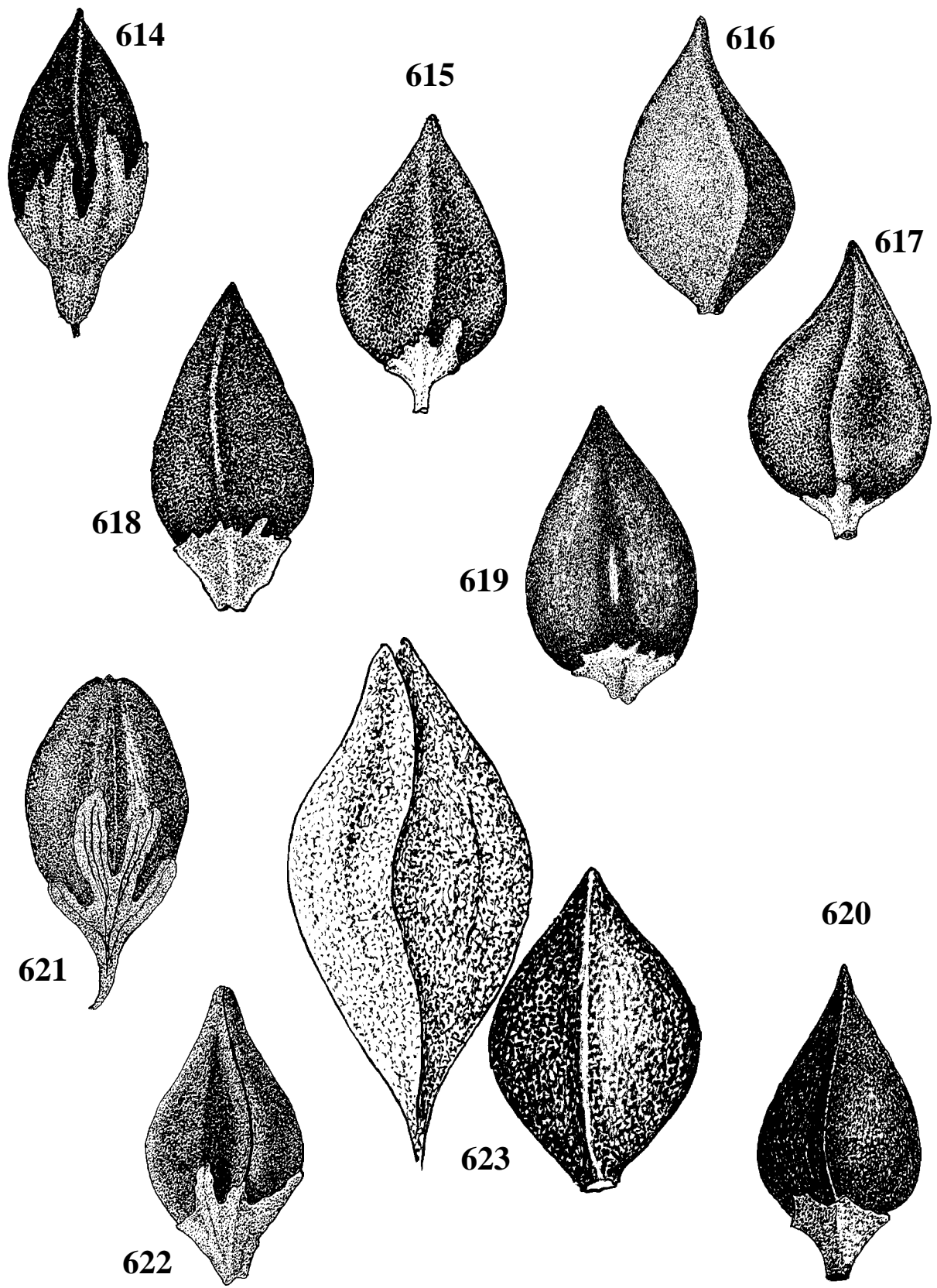
**619. *Polygonum maritimum*** L. – Perennial, up to 20-80 cm high, glaucous, twigs prostrate, rigid. **Fruits achenes with sepals, broad ovoid, three-sided, transversal section triangular, concave between angles, apex acuminate, base truncate, 3.3-3.7 x 2.2-2.5 mm. Surface glabrous, glossy, angles bowly vaulted, dark-brown. 2n = 20.** Native to littoral sandy, saline deposits in Europe, Asia Minor and North America. Ro, Uk.

**620. *Polygonum rurivagum*** Jordan ex Boreau – Annual, up to 5-40 cm high, stems usually erect, switchly ramified. **Fruits achenes with sepals, regular three-sided, ovate, slight exerted from the perianth, apex acuminate, 2-2.5 x 1-1.4 mm. Surface lustrous, with low tubercles in dense rows, brown to dark-brown. 2n = 20, 60.** Mainly in Europe, extending north-eastwards to Sweden, in surroundings of human dwellings, waste places, sandbanks, usually a weed in fields. Mo, Ro, Sk.

**621. *Rubrivena polystachya*** (Wall. ex Meissn.) Král, *Polygonum polystachyum* Wall. ex Meissn. – Perennial, stems 60-120 cm high, stout, erect, arising from a creeping underground rhizome. **Fruits achenes with sepals, ellipsoid or ovate, two dorsal and one ventral side concave, apex truncate, bottom with a perianth, 5.7-6.3 x 3.4-3.8 mm. Surface smooth, lustrous, pale-brown.** Originally growing in the Himalayas; in the Carpathians cultivated in gardens and rarely naturalized.

**622. *Fallopia aubertii*** (L. Henry) Holub, *Polygonum baldschuanicum* auct non Regel – Perennial or shrub, stems or shrubs woody at base, up to 15 m high, twining. **Fruits achenes included in persistent perianth, elliptic-rhombic, triangular in transversal section, sides concave, angles acute, margins entire, apex gradually pointed, 4-4.6 x 2-3 mm. Surface slightly shiny, densely minutely granular, fruiting perianth glabrous, black. 2n = 40.** Native to China; in the Carpathians cultivated for ornament (hedges, cover of cottages), extensively naturalized from gardens.

**623. *Fallopia convolvulus*** (L.) Á. Löve, *Bilderdykia convolvulus* (L.) Dumort., *Polygonum convolvulus* L. – Annual, stems procumbent, twining or spreading, angular, downy or farinose, up to 100 cm long. **Fruits**



achenes included in persistent perianth, elliptic-rhombic, triangular, sides concave, angles subacute, margins entire, 4-5 x 2.3-2.7 mm. Surface lustreless, minute punctate, black. Seeds rhomboid, apex acuminate, 3-3.4 x 2-2.4 mm.  $2n = 40$ . Originally growing in Eurasia, cosmopolitan at present, on waste places, shrubs, tilled grounds; in the whole Carpathians.

**624. *Fallopia dumetorum* (L.) Holub, *Fagopyrum dumetorum* (L.) Schreb., *Polygonum dumetorum* L.** — Annual, stems twining, 50-200 cm long. **Fruits achenes included in persistent perianth, trigonous, broad winged, wings flat to undulate, 6-7 x 4.5-5 mm. Surface greenish or reddish-brown. Seeds elliptic-rhombic, triangular in section, sides concave, angles subacute, 2.5-3.5 x 1.8-3 mm. Surface smooth, lustrous, black.  $2n = 20$ .** Native to Eurasia and North America, usually on wet places, in hedges or among the native vegetation, coastal shrub-beries; throughout the Carpathians.

**625. *Fallopia japonica* (Houtt.) Ronce Decr., *Reynoutria japonica* Houtt.** — Perennial, stems glaucous, 100-250 cm, numerous, frequently red-spotted, ramified above. **Fruits winged achenes, wings broad flat, 11-13 x 5-6 mm. Seeds trigonous, angles acute, apex pointed, 3-3.6 x 1.2-1.4 mm. Surface glabrous, lustrous, brownish-black to black.  $2n = 44, 88$ .** Native to eastern Asia, usually cultivated (as a decorative) in parks and (as a vegetable) in gardens, often hauling along rivers, brooks, ruderalized areas, extensively naturalized. Hu, Pl, Ro, Sk, Uk.

**626. *Fallopia sachalinensis* (F. Schmidt) Ronse Decr., *Reynoutria sachalinensis* (F. Schmidt) Nakai** — Perennial, very similar to *F. japonica*, slight more robust, up to 3 m high, leaves with a cordate-shaped base. **Fruits winged achenes, 10-11 x 3.7-4.3 mm. Seeds elliptic, angles acute, apex gradually pointed, 2.6-3 x 1.1-1.3 mm. Surface glabrous, lustrous, darkish-brown.  $2n = 40$ , c. 66.** Originally spread from eastern Asia; cultivated in parks and gardens from lowlands to uplands, often escaping and naturalized. Pl, Ro, Sk, Uk.

**627. *Fagopyrum esculentum* Moench, *F. sagittatum* Gilib, *F. vulgare* Hill.** — Annual, glabrous or downy, stems 15-80 cm high, erect, ramified, reddish on later. **Fruits achenes included in persistent perianth, ovate, sharp trigonous, apex pointed, sometimes slight winged, sides slight convex, angles acute, margins entire, fruiting perianth glabrous,**

**5.2-6 x 3.3-3.9 mm. Surface smooth, transversal fine striate, red-brown or pale-grey.  $2n = 16$  (32, 64).** Originally growing in central Asia; cultivated as a grain crop in most the Carpathians, seldom naturalized. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**628. *Fagopyrum tataricum* (L.) Gaertn., *Polygonum tataricum* L.** — Annual, up to 50-100 cm high, stems glabrous, seldom reddish-spotted. **Fruits achenes included in persistent perianth, triquetrous, irregular rugose, with obtuse angles, slight winged, wings margins undulate, apex pointed, fruiting perianth glabrous, 4.2-5 x 2.8-3.5 mm. Surface tubercled or roughish sulcate, lustreless, olive-grey or nut-brown.  $2n = 16$  (32).** Native to central Asia; cultivated less often than *F. esculentum*, widely growing as a ruderal or weed in fields; in the whole Carpathians.

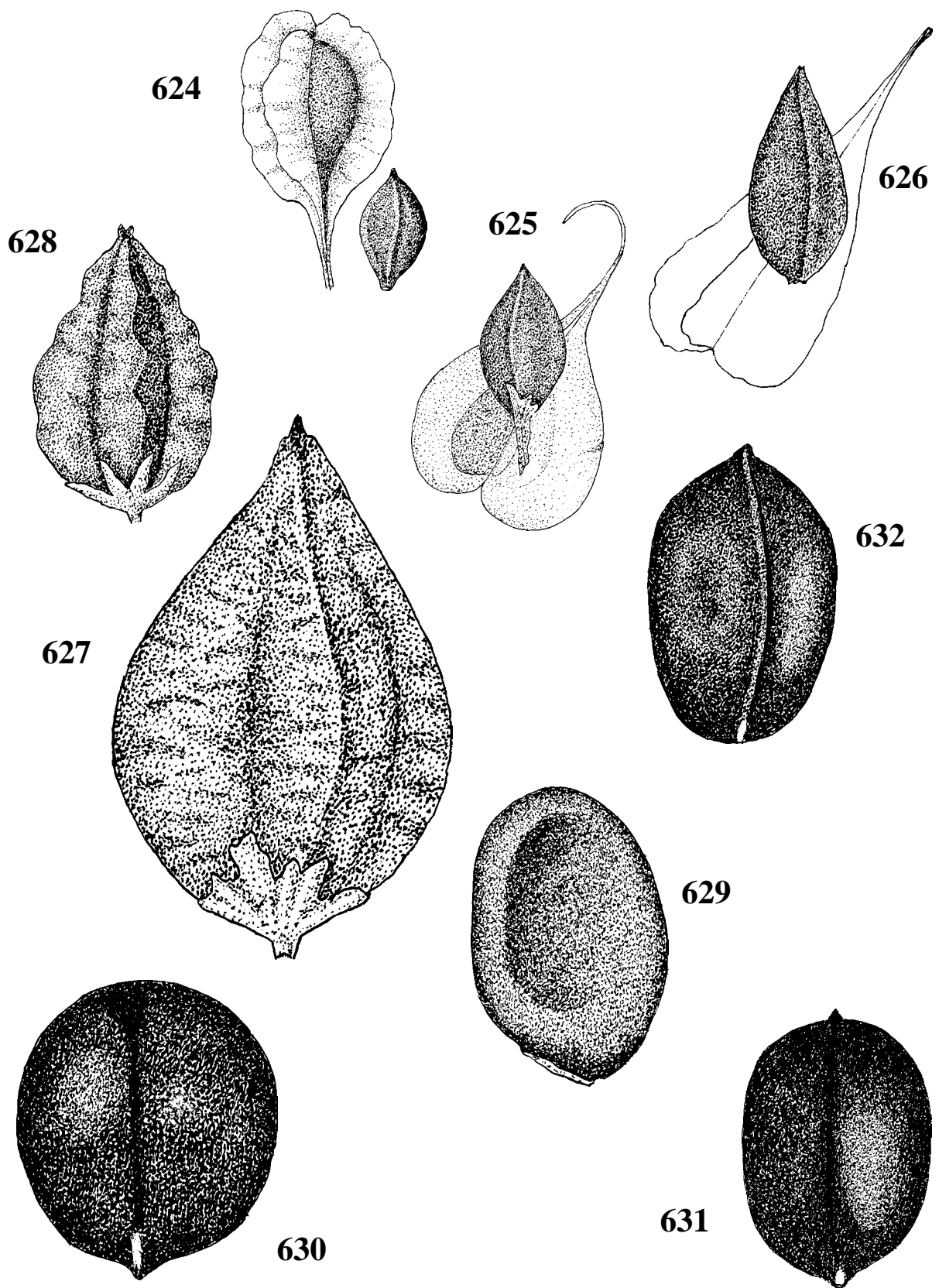
### 37. PAEONIACEAE

**629. *Paeonia albiflora* Pall., *P. lactiflora* Pall., *P. sinensis* Poir.** — Perennial, stems many-flowered, 60-100 cm high, flowers pale-pink or white. **Seeds ellipsoid or globular to rhomboid, flattish, on sides concave without a visible suture, 6.5-7.5 x 4.7-5.3 mm. Surface smooth, lustrous, brownish-black.  $2n = 10$ .** Originally growing in mountains of eastern Asia; presently cultivated in gardens and parks, but only in full-flowering cultivars.

**630. *Paeonia daurica* Andrews, *P. triternata* Pall.** — Perennial, stems branched at base, up to 80 cm high, leaves simply biternate, or with few divided leaflets. **Seeds  $\pm$  globular, with hilum and faint distinct suture on the ventral side, 6.5-7.5 x 6-7 mm. Surface glabrous, glossy, black.** Native to southeastern Europe, in woods and forest clearings. Ro, Uk.

**631. *Paeonia mascula* (L.) Mill., *P. corallina* Retz.** — Perennial, up to 80 cm high, stems ramified only at base. **Seeds elliptic, globular, with little expressive concave suture on the ventral side, 7-8.5 x 5-6 mm. Surface smooth, shining, at first red, black later on.  $2n = 10, 20$ .** Originally growing in light forests of southeastern Europe; rarely cultivated in gardens throughout the Carpathians and Europe.

**632. *Paeonia officinalis* L., *P. decora* G. Anders., *P. foemina* (L.) Gars.** — Perennial, stems 30-90 cm high, flowers dark-red, seldom white or yellowish. **Seeds obovate or ellipsoid, dorsal and ventral sides convex, ventral side with suture in the middle,**



usually depression, 6-9 x 4.5-6.5 mm. Surface smooth, shining, black.  $2n = 20$ . Native to the overgrown rocks of southern Europe; cultivated for ornament in gardens and parks, mostly in full-flowering cvs, in the whole Carpathians. Hu, Ro, Sk, Uk.

**633. *Paeonia peregrina*** Mill. — Perennial, stems 30-80 cm high, glabrous, flowers red or white. **Seeds ellipsoid, transverse section rounded, concave suture on the ventral side, 7.5-8.5 x 5.4-6 mm. Surface smooth, lustrous, black.  $2n = 20$ .** Native to the steppes of southeastern Europe and southeastern Asia; often cultivated in gardens and parks as ornamental, sometimes escaping into the nature. Mo, Ro.

**634. *Paeonia suffruticosa*** Andrews, *P. arborea* Donn, *P. moutan* Sims. — Shrub, woody stems 60-150 cm high, with white, pink or red flowers. **Seeds irregular rounded, with suture only in bottom half or without, hilum rounded or oval, 9-11 x 8-10 mm. Surface smooth, lustrous, brownish-black or black.  $2n = 10$ .** Native to eastern Asia; cultivated in gardens and parks for ornament, mostly in full-blossom, odorous forms, in the whole Carpathians.

**635. *Paeonia tenuifolia*** L. — Perennial, up to 40 cm high, stems one-flowered, leaves divided into many linear segments. **Seeds cylindrical, with or without suture and oblong hilum, 6.8-7.4 x 3.3-3.9 mm. Surface glabrous, very shining, black.  $2n = 10$ .** Originally growing in Asia Minor and southeastern Europe, in steppes, stony slopes, forest clearings; cultivated in full- or simple-flowering forms of red or pink colour, rarely in gardens and parks; in the whole Carpathians.

### 38. RANUNCULACEAE

**636. *Helleborus dumetorum*** Waldst. et Kit. — Perennial, stems up to 45 cm high, little branched, basal leaves not overwintering. **Seeds cylindrical, with a distinct membranous suture on the ventral side, 3.8-4.2 x 2.1-2.4 mm. Surface reticulate wrinkly, shining, brownish to brown, up to black.  $2n = 32$ .** Native to leafy woods and shrubs of central and eastern Europe; cultivated in gardens as an ornamental plant. Hu, Pl, Ro, Sk, Uk.

**637. *Helleborus foetidus*** L. — Perennial, stems 20-80 cm high, erect, all densely leafy, many-flowered, glandular-puberulent, fetid, stout, overwintering. **Seeds cylindrical, with membranous suture on the ventral side, 3.8-4.8 x 1.7-2.5 mm. Surface**

**dense furrowed, lustrous, dark-brown.  $2n = 32$ .** Native to southwestern Europe and northwestern Africa; in the past cultivated as a medical plant, rarely escaping, calcicole. Hu.

**638. *Helleborus niger*** L. — Perennial, stems 15-30 cm high, one to three flowered, basal leaves overwintering. **Seeds reniform cylindrical, with a broad membranous suture on the ventral side, 4-5 x 1.8-2.5 mm. Surface socketly and along furrowed, lustrous, pale or blackish-brown, suture dirty-yellowish.  $2n = 32$ .** Originally growing in mountain forests and thickets of southwestern Europe, in calcareous stony soil; often cultivated in gardens as an ornamental plant, sometimes naturalized.

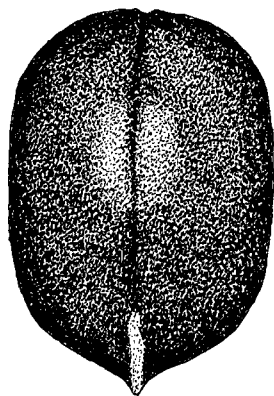
**639. *Helleborus odoratus*** Waldst. et Kit. — Perennial, up to 40-60 cm high, stems and shoots erect, basal leaves overwintering. **Seeds cylindrical with a narrow, membranous suture on the ventral side, 3.6-4.4 x 1.8-2.4 mm. Surface deep furrowed, lustrous dark- to black-brown.  $2n = 32$ .** Native to southwestern Europe; in light mountain woods; cultivated as a medical plant, uniquely naturalized. Hu, Ro.

**640. *Helleborus purpurascens*** Waldst. et Kid. — Perennial, stems poorly leafy, up to 35 cm high, basal leaves not overwintering. **Seeds cylindrical, with a distinct suture on the ventral side, 4-5 x 1.8-2.2 mm. Surface furrowed, lustrous, dark- to blackish-brown.  $2n = 32$ .** Originally growing in eastern Europe, mainly in beech woods of the Carpathians; frequently cultivated in gardens as an ornamental hybrids, easily escaping. Br, Hu, Pl, Ro, Sk, Uk.

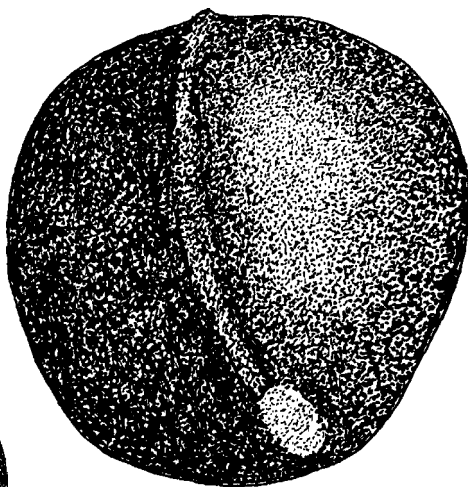
**641. *Helleborus viridis*** L. — Perennial, stems up to 40 cm high, ramified and leafy at the top. **Seeds cylindrical or ovate, with a suture on the ventral side, 3.2-4.8 x 1.8-2.4 mm. Surface furrowed, lustrous, dark- or blackish-brown.  $2n = 32$ .** Native to light woodlands of western and central Europe, on lime substrates; in the past cultivated as a medical plant, escaping here and there till now. Pl, Sk, Uk.

**642. *Eranthis hyemalis*** (L.) Salisb., *Helleborus hyemalis* L. — Perennial, stems erect or glabrous, 5-20 cm high, with a vertical of 3 palmly divided leaves and one flower on top. **Seeds obovate or cylindrical, flattish, sides concave or more-angular, suture convex, darker, 1.9-2.5 x 1.5-2.1 mm. Surface humpy, yellowish to dark-brown.  $2n = 16$ .** Native to wet woods of southern Europe; often

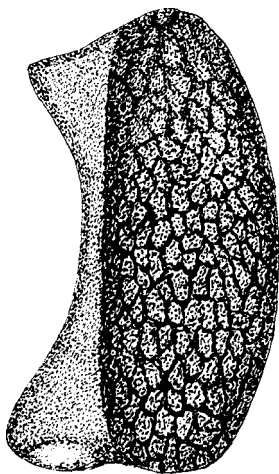




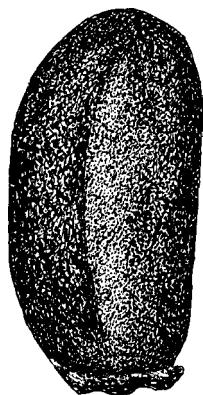
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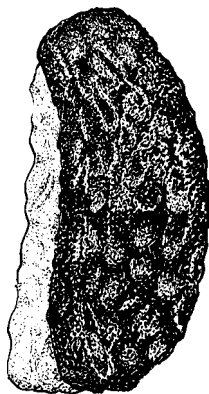
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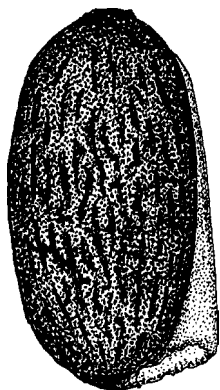
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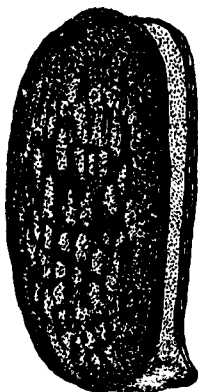
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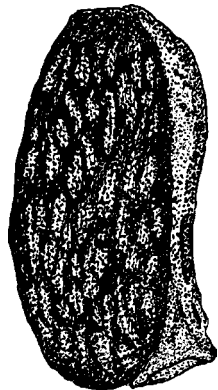
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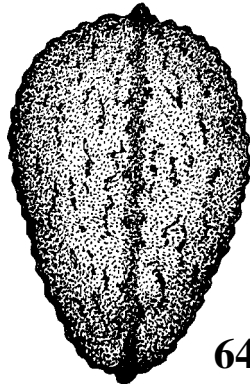
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cultivated for ornament and naturalized from gardens. Hu, Ro, Sk.

**643. *Nigella arvensis* L.** — Annual, stems erect, more or less glabrous, poorly ramified, 15-45 cm high. **Seeds half-moon formed, angles sharp, faces plane, slight concave or convex, transverse section triangular, 2-2.5 x 1.1-1.5 mm. Surface lustreless, papillae-granulated, black-brown to black. 2n = 12.** In most of Europe, except the north, in lowlands and warmer uplands, weed in tilled soils (mostly cornfields) and open grounds; in the whole Carpathians.

**644. *Nigella damascena* L.** — Annual, up to 20-60 cm high, stems ramified, glabrous. **Seeds ovate, base mostly moderate acute, transverse section triangular, angles ridged, faces convex, 2.6-3 x 1.5-2 mm. Surface lustreless, interspaces waved, black. 2n = 12.** Native to southern Europe, on fallows fields, dunes, roadsides; frequently cultivated for ornament and more or less naturalized in the whole Carpathians.

**645. *Nigella sativa* L.** — Annual, up to 55 cm high, stems erect, more or less ramified, weakly roughly hirsute. **Seeds ovate-triangular, transverse section triangular, angles ridged, faces plane or slight convex, 2.9-3.5 x 1.3-2 mm. Surface lustreless to barely lustrous, interspace ocellate, ridges granulate, black. 2n = 12.** Probably native to southeastern Europe; widely cultivated for its aromatic seeds, and frequently naturalized; throughout the Carpathians.

**646. *Caltha cornuta* Schott; Nyman et Kotschy, *C. palustris* subsp. *cornuta* (Schott; Nyman et Kotschy) Hegi** — Annual, robust, stems procumbent, 10-70 cm long. **Seeds follicular, bottom part vertical cylindrical, dark-brown, top part horizontal cylindrical, reddish, both parts with different structures, 2.2-2.6 x 1-1.2 mm. Surface reticulate-foveolate, reddish-brown, lustreless. 2n = 16.** Native to central Europe and the Balkan Peninsula, in swamps, waterlogged places, standing water banks. Pl, Ro, Sk, Uk.

**647. *Caltha laeta* Schott; Nyman et Kotschy, *C. palustris* subsp. *laeta* (Schott; Nyman et Kotschy) Hegi** — Perennial, a plant 20-30 cm high, stems poorly ramified, often one-flowered. **Seeds cylindrical, sometimes furrowed or with concave sides, fine structured, apex gradually pointed, 1.7-2 x 0.8-1 mm. Surface longitudinal furrowed, slight**

**shining, dark-brown. 2n = 24, 32-72.** Native to central Europe and the Balkan Peninsula, on alder (*Alnus* spp.) swamps, reed (*Carex* spp.) beds, muddy ditches and ponds banks. Hu, Pl, Ro, Sk, Uk.

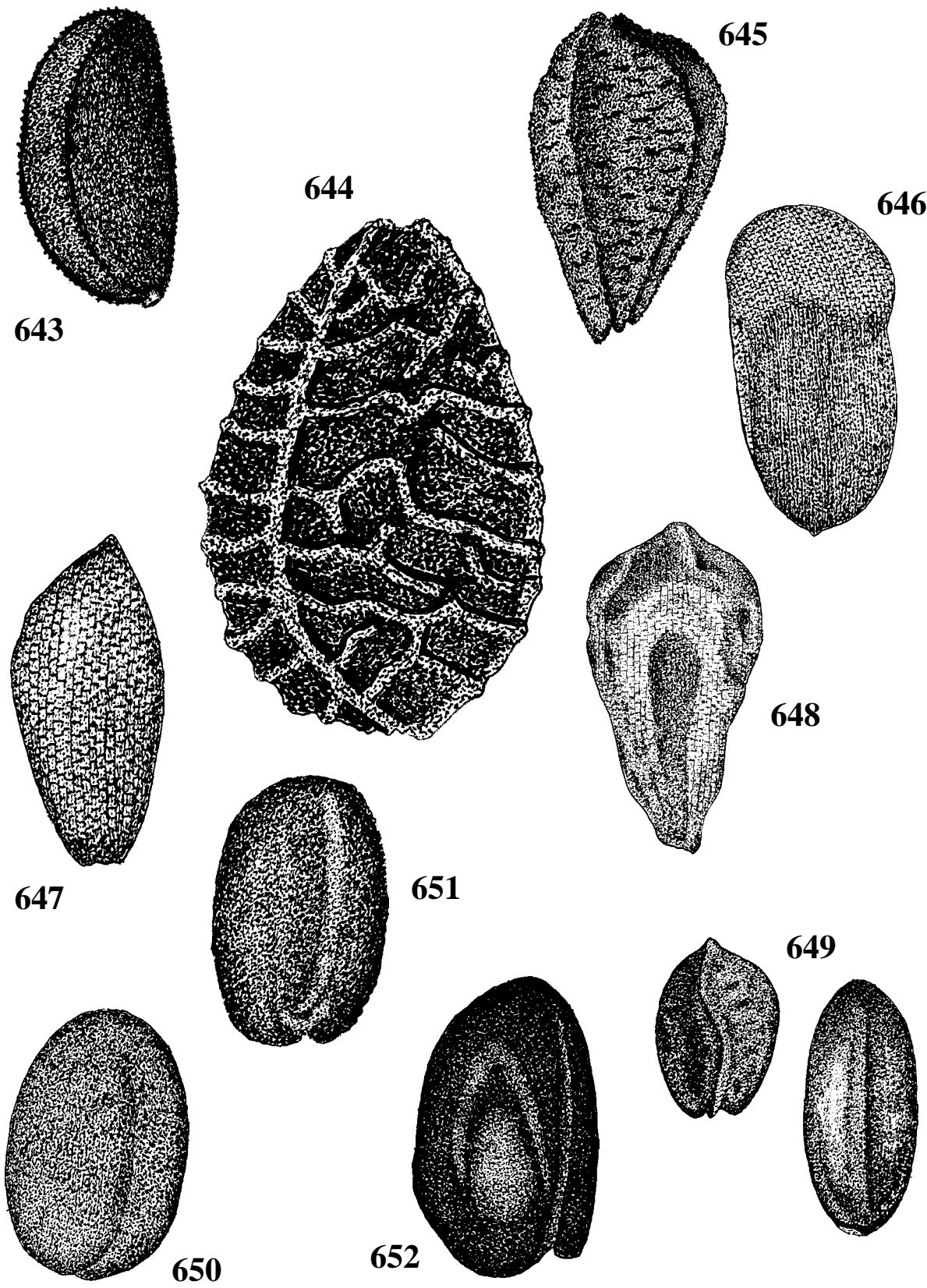
**648. *Caltha palustris* L. subsp. *palustris*** — Perennial, stems procumbent or ascending, rarely erect, hollow, glabrous, 10-60 cm long, more or less ramified on top. **Seeds obovate, cuneate, apex rounded, 2.5-3 x 1.2-1.6 mm. Surface lustrous, fine structured, furrowed, reddish to dark-brown. 2n = 36, 72.** Native throughout the Carpathians, to northern and eastern Europe as far as Russia, on swamps, lake-margins, river and brookbanks, waterlogged meadows; throughout the Carpathians.

**649. *Trollius altissimus* Crantz, *T. europaeus* auct. non L.** — Perennial, stems 40-100 cm high, glabrous, non-ramified, one-flowered. **Seeds cylindrical or globular, with suture and concave sides, 1.3-2.3 x 0.8-1.1 mm. Surface faint waved, lustrous, glabrous, black. 2n = 16.** Widespread in mountains of whole Europe, on moist meadows and pastures rich in humous. Br, Hu, Pl, Ro, Sk, Uk

**650. *Trollius asiaticus* L.** — Perennial, stems 30-60 cm high, basal leaves long-petiolate, 5-lobed, lobes serrate; honey-leaves 2-3 times as long as the stamens. **Seeds ellipsoidal, radicle as long as cotyledons, 1.6-2 x 1-1.3 mm. Surface fine waved, lustrous, black.** Native to northeastern Europe (Altai) at forest margins, meadows, in shady valleys of northern slopes; rarely cultivated in the Carpathian gardens as ornamental.

**651. *Trollius chinensis* Bge** — Perennial, stems 70-90 cm high, flowers orange-yellow. **Seeds ellipsoid, radicle as long as cotyledons, 1.3-1.6 x 0.8-1.2 mm. Surface fine waved, lustrous, blackish to black.** Native to China and Manchuria; rarely cultivated in the Carpathians, in gardens as ornamental.

**652. *Trollius hybridus* hort.** — Perennial, an ornamental cultivated forms originated by hybridization *T. altissimus* x *T. asiaticus* L. or *T. chinensis* Bunge, cultivated mostly in parks as a permanent plant. **Seeds ± ellipsoid or short ellipsoid of various magnitudes, faint lateral compressed, radicle usually shorter than cotyledons, 1.2-1.8 x 0.8-1 mm. Surface faint waved, lateral side often depressed, glossy, black.** Cultivated mostly in parks as a permanent plant.



**653. *Cimicifuga cordifolia*** Pursh — Perennial, a plant 100-150 cm high, flowering in August, with white flowers, quite similar to *C. europaea*. **Seeds ellipsoid with many small scales on their surfaces, 3-3.6 x 2.2-2.6 mm. Surface cinnamon-brown.** Native to North America; in the Carpathians sporadically cultivated in gardens and natural parks.

**654. *Cimicifuga europaea*** Schipcz., *C. foetida* auct. non L. — Perennial, up to 50-200 cm high, stems erect, glabrous, grooved, ramified, fetid. **Seeds ellipsoid, loosely covered with dense upright patent lustrous scales, 3.2-3.8 x 2.3-2.7 mm. Surface brown, scales light-brown. 2n = 16.** An Eurasian species, common mainly in the whole Carpathians, in shrubberies, deciduous forests, clearings of the montane zone, mainly in calcareous soils; often cultivated in gardens. Br, Hu, Pl, Ro, Sk, Uk.

**655. *Cimicifuga japonica*** (Thunb.) Spreng., *Actaea japonica* Thunb. — Perennial, a plant up to 120 cm high, flowering stems without leaves, flowers white. **Seeds ellipsoid with many very short scales on their surfaces, 2-2.8 x 1.3-1.8 mm. Colour of scales dark-brown.** Originally from Japan; in the Carpathians rarely cultivated in gardens as an ornamental, especially nice in autumn.

**656. *Cimicifuga racemosa*** Nutt. — Perennial, stems 180-250 cm, flowers white, in slender racemes. **Seeds ellipsoid, with many small scales on the surface, 3-4 x 1.8-2.6 mm. Surface pale or dark-brown, ± lustrous.** Native to North America, in leafy woods; in the Carpathians rarely cultivated in gardens as ornamental.

**657. *Actaea spicata*** L. — Perennial, up to 30-60 cm high, stems erect, poorly branched. **Seeds blunt triangular, rounded, concave and plane, mostly orange-segment-formed, flattish, 3.2-4 x 2.1-2.5 mm. Surface with mostly elongated reticulum-meshes, ribs or lines red- to dark-brown. 2n = 16.** An Eurasian species, but only in mountains, in shady deciduous forests, shrubberies, local on lime-stone; seldom cultivated in parks and gardens, throughout the Carpathians.

**658. *Delphinium cuneatum*** Stev. ex DC., *D. rossicum* Litw. — Perennial, stems 100-120 cm and deflexed hairs below. **Seeds cuneate, mostly 3-angled, with 3 membranous wings at angles, transverse sections irregular triangular, 3.1-3.5 x 1.7-1.9 mm. Surface glabrous, lustrous, waved or**

**furrowed, dark-grey.** Native to forests, shrubberies, clearings and cleared areas, in eastern Europe, the Caucasus, central Asia. Br, Uk.

**659. *Delphinium elatum*** L., *D. intermedium* Sol. — Perennial, up to 40-200 cm high, stems erect, glabrous or scarcely hirsute, mostly simple. **Seeds cylindrical or cuneate, winged at 3 angles, transverse section triangular, 3.1-3.6 x 1.6-1.8 mm. Surface furrowed or undulated, blackish-brown, wings paler. 2n = 32.** Originally an Eurasian species, widespread in light woodlands, along mountain brooks and wet meadows; commonly cultivated in gardens for ornament. Br, Pl, Ro, Sk.

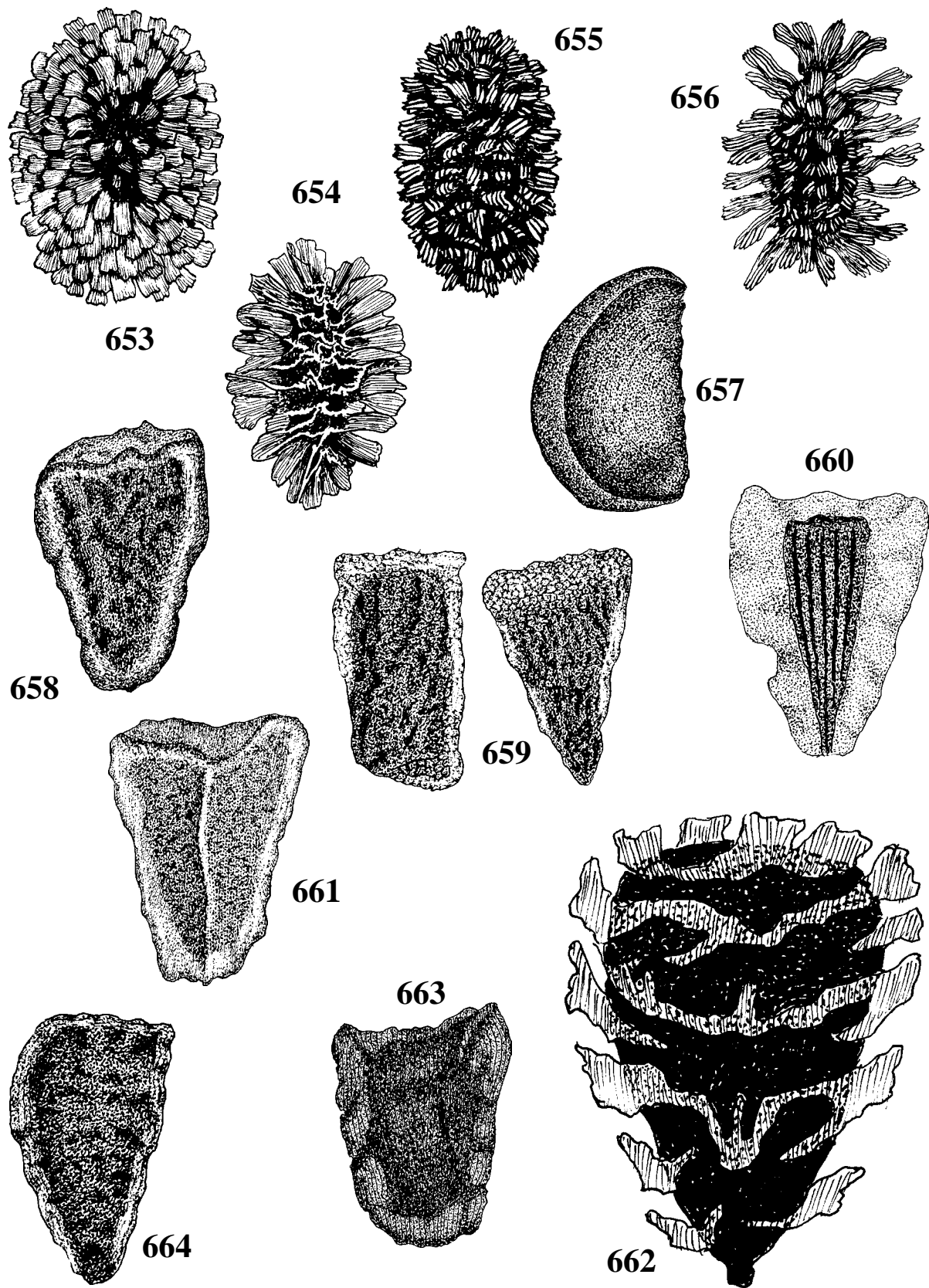
**660. *Delphinium grandiflorum*** L. — Perennial, stems up to 150 cm high, with large flowers. **Seeds ± triangular, often with broad membranous wings on edges, 2.9-3.3 x 2.4-2.6 mm. Surface dull, dark-greyish, wings lustrous, pale-brown.** Native to east Asia; in the Carpathians rarely cultivated in gardens as a decorative plant.

**661. *Delphinium oxysepalum*** Borbás et Pax, *D. alpinum* Sloboda — Perennial, stems erect 10-60 cm high, mostly non-branched, pubescent above, glabrous below. **Seeds cuneate, 3-angled with membranous wings, 2.6-3.2 x 2.2-2.4 mm. Surface wrinkly, glabrous, dark-brown, wings paler. 2n = 32.** Endemic species to western Carpathians, in skeletal soils, screes and high-mountain meadows. Pl, Sk.

**662. *Delphinium pallasii*** Nevski — Perennial, stems 50-60 cm high, ± roundish, all stem leaves longly stalked. **Seeds obovoid, with some transversal wings, apex truncate, bottom gradually narrowed, 2.3-2.7 x 1.6-1.9 mm. Surface dull, blackish-brown, wings whitish-grey.** Native to the Crimea; in the Carpathians rarely cultivated in gardens as ornamental. Uk.

**663. *Delphinium simonkaianum*** Pawl., *D. pyramdatum* auct. — Perennial, stems erect, 60-150 cm high, glabrous, branched above. **Seeds ± triangular or flat, winged on angulars with semitransparent membrane, 2.7-3.3 x 2-2.5 mm. Surface wrinkly, glossy, brown.** Native to Romania as an endemic, on calcareous hills, cut-over areas of pine forests. Ro.

**664. *Delphinium x hybridum*** hort., *D. cultorum* Voss — Perennial, species originated hybridization from species *D. cheilanthum* Fisch ex DC., *D. elatum* and *D. grandiflorum*. Stems up to 150-180 cm high.



Seeds  $\pm$  obovoid or triangular, apex truncate, bottom gradually narrowed, whole margin winged, 3.4-4 x 2-2.6 mm. Surface wrinkly, lustrous, dark-brown. Often cultivated in the Carpathians, in parks and gardens for nice large white-blue flowers.

**665. *Consolida ambigua* (L.) F. W. Ball et Heywood, *Delphinium ambiguum* L.** – Annual, 30-100 cm high, stems erect, more or less ramified, puberulent. **Seeds mostly cuneate, transverse section irregular rounded, scaly, 1.8-2.3 x 1.3-1.7 mm. Surface lustrous, brown to black-brown, wing-list of scales arranged spiral, their margins dark-edged.  $2n = 16$ .** Native in Mediterranean region, Middle Asia, locally naturalized elsewhere; often cultivated in gardens in various cvs. Hu, Pl, Sk.

**666. *Consolida fissum* (Waldst. et Kit.)** – Perennial, up to 1 m high, stems erect, simple or little-ramified, shortly hirsute. **Seeds cylindrical or cuneate, transverse section oval, with membranous scales, 2.7-3 x 2-3.3 mm. Surface scattered hirsute, dull, nigrescent, scales translucent, undulate.** Native to southern Europe, western Asia, in light woodlands and their margins, stony slopes, in calcareous grounds in mountains; a decorative species. Ro.

**667. *Consolida orientalis* (Gay) Schrödinger, *Delphinium orientale* Gay** – Annual, stems 30-100 cm high, simple or branched, with rich cluster of red-violet flowers. **Seeds heterogeneous, usually cuneate, transverse irregular rounded, scaly, 2-2.4 x 1.3-1.7 mm. Surface glabrous, reddish-brown, wing-list of scales arranged in wavy rows, scales dark-margined.  $2n = 16$ .** Native to southeastern Europe, in fields, fallows as weed; cultivated in gardens as a summer plant, naturalized locally.

**668. *Consolida regalis* Gray, *C. segetum* (Lam.) Gray, *Delphinium consolida* L.** – Annual, 15-80 cm high, stems erect, ramified, hairy. **Seeds cuneate or obovate, transverse section irregular rounded or triangular, scaly, 2-2.5 x 1.2-1.7 mm. Surface lustrous, black-brown, wing-list lobate, arranged in rows of light grey-brown scales.  $2n = 16$ .** Native to most of Europe, except the extreme north and south, on rocky steppes, stony slopes and scree, weed in cereal fields and gardens. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**669. *Aconitum anthora* L.** – Perennial, up to 50-100 cm high, stems erect, densely leafy, on top

downy. **Seeds of various shapes, often pyramidal, irregular 4-sided, transverse section triangular, angles acute, without wings, 3-3.9 x 1.9-2.3 mm. Surface wrinkly, glabrous, blackish-grey to black.  $2n = 32$ .** An Eurasian species, mainly in mountains, light deciduous and bushy forests, shrubberies, rocky slopes. Hu, Mo, Ro, Sk, Uk.

**670. *Aconitum callibotryon* Rchb., *A. laetum* Rchb.** – Perennial, up to 20-120 cm high, stems erect, non-ramified. **Seeds cylindrical, with partial or undivided wings in angles, 3.3-3.7 x 1.8-2.5 mm. Surface wrinkly, glabrous, lustrous, pale- to dark-brown, wings translucent.  $2n = 32$ .** Native to the Sudeten Mountains and the East Carpathians, along brook margins, springheads, in mountain meadows, glacial basins. Cz, Pl, Ro.

**671. *Aconitum degenii* Gay, *A. paniculatum* var. *subalpinum* Rapaics** – Perennial, stems 50-80 cm high, inflorescence with few violet flowers. **Seeds  $\pm$  obovoid or triangular, apex truncate, bottom gradually narrowed, 2.9-3.3 x 1.7-2 mm. Surface covered with many membranous wings.** Native to central Europe, in light woods and their margins, mountain meadows, rarely cultivated in gardens as ornamental. Ro, Uk.

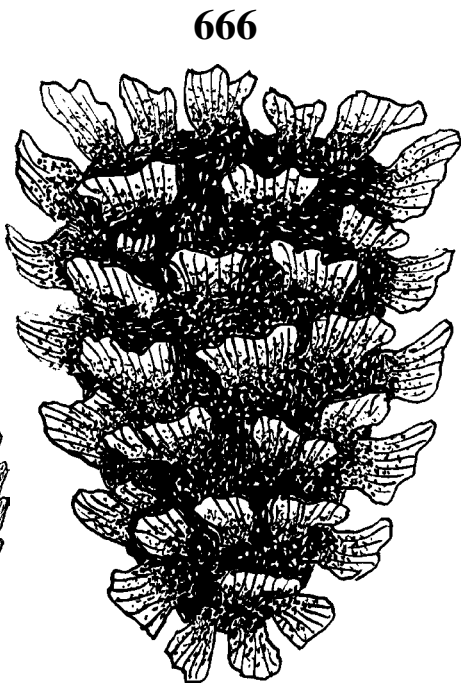
**672. *Aconitum excelsum* Rchb., *A. lasiostomum* Rchb. subsp. *excelsius* Zapal.** – Perennial, stems 1-1.8 m high, pubescent, inflorescence racemose 50-60 cm long. **Seeds cylindrical, transversal section triangular, apex truncate, bottom slight narrowed, winged at edges and transversal, 3-3.5 x 2-2.3 mm. Surface dull, dark-brown, wings pale-brown.** Native to Romania, in spruce woods, on peaty-soils. Br, Ro.

**673. *Aconitum firmum* Rchb., *A. napellus* L., *A. tatrae* Borbás** – Perennial, stems erect, 50-150 cm high, ramified in the upper part. **Seeds heterogeneous, mostly cuneate, transverse section 3-angular, one angle with broader wing, 4-4.6 x 2.8-3.2 mm. Surface wrinkly, glabrous, lustrous, brown to blackish-brown.  $2n = 32$ .** A Carpathian endemic plant, growing on mountain meadows, springheads, brook bands, moist scree. Ro, Sk, Uk.

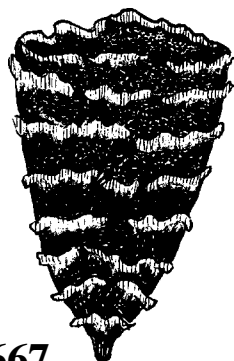
**674. *Aconitum lasiocarpum* (Rchb.) Gáyér, *A. toxicum* Rchb. subsp. *lasiocarpum* (Rchb.) Grint.** – Perennial, stems inflorescence glandular hairy. **Seeds obovate or cylindrical, transverse section triangular, angles broad winged, 3.9-4.5 x 2.7-3.1 mm.**



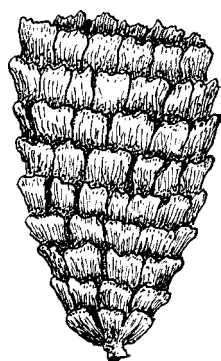
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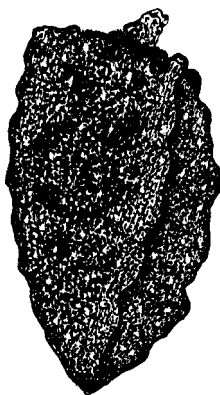
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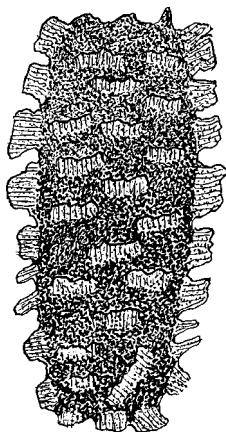
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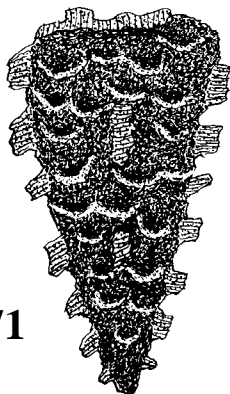
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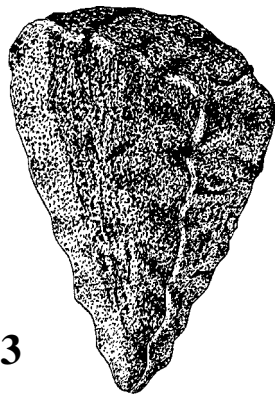
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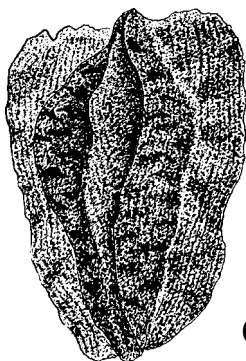
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Surface glabrous, lustrous, horizontal wrinkly, dark-brown. Native to southeastern Europe, occurrence on sunny rocks, dry slopes of hills and mountains. Ro, Sk.

**675. *Aconitum lasiostomum*** Rchb., *A. velutinum* (Rchb.) G. Grint. — Perennial, stems 1-1.5 m high, strong, faint ribbed at base. **Seeds obpyramidal or obtriangular with horizontal rows of small scales on their surface, 3-3.5 x 1.9-2.1 mm. Surface fine grooved, lustrous, blackish to black.** Native to southeastern Europe, in forest margins, clearings, shrubberies, mostly in the upland zone; as a decorative species exploited in gardening. Mo, Pl, Ro, Uk.

**676. *Aconitum moldavicum*** Hacq. ex Rchb., *A. lycoctonum* subsp. *carpathicum* (DC.) Warncke — Perennial, stems 50-120 cm high, erect, branched, flowers blue-violet or reddish-violet. **Seeds obpyramidal, transversal section  $\pm$  triangular, apex truncate, bottom gradually narrowed, not or very seldom winged at one angle, 3.2-3.8 x 2-2.5 mm. Surface horizontal wrinkly, lustrous, dark-brown to blackish. 2n = 16.** Native to eastern Europe, Carpathian endemic, in leafy shady woods, in stony and rocky alkaline or neutral grounds; used as ornamental in gardening. Hu, Mo, Pl, Ro, Sk, Uk.

**677. *Aconitum paniculatum*** Lam. — Perennial, up to 40-200 cm high, stems frequently reddish, ramified, glandular-downy in the upper part. **Seeds obovate or elliptical, transverse section triangular, with several wings on one side of the seed, 3.5-4.5 x 2.3-2.7 mm. Surface slight lustrous, glabrous, pale to dark-brown. 2n = 16.** Native to mountains of central Europe, extending as far as Italy and Romania, in wet light forests, grassy and littoral shrubberies. Pl, Ro, Sk, Uk.

**678. *Aconitum tauricum*** Wulf. — Perennial, up to 20-60 cm high, stems stiff, non-branched, erect. **Seeds triangular, flattish, apex truncate, base narrowed with hilum, winged on one side, 3.7-4.3 x 2.2-2.6 mm. Surface horizontal wrinkly, lustrous, glabrous, dark-brown.** Native to Europe, on grassy and rocky slopes, in subalpine and alpine zones. Pl, Ro.

**679. *Aconitum variegatum*** L., *A. dominii* Sill. — Perennial, up to 25-200 cm high, stems erect, frequently reddish, glabrous, ramified, often crooked. **Seeds cuneate, the side transversal plicate, winged at one angle, 3.4-4.1 x 1.9-2.5 mm. Surface lustrous,**

**glabrous, dark-brown. 2n = 16.** Endemic to the mountains of central Europe, in deciduous lowland forests, littoral shrubberies along the mountain brooks. Hu, Pl, Ro, Sk, Uk.

**680. *Aconitum vulparia*** Rchb., *A. lycoctonum* L. em. Koeller — Perennial, stems ascending,  $\pm$  little branched, downy above, 40-150 cm high. **Seeds blunt triangular, apex truncate, bottom narrowed, winged at edges and transversal, 3.3-3.7 x 1.7-1.9 mm. Surface slight lustrous, blackish. 2n = 16.** Native to central Europe, in lowland and shady leafy woods, on humous, stony soils. Hu, Pl, Ro, Sk.

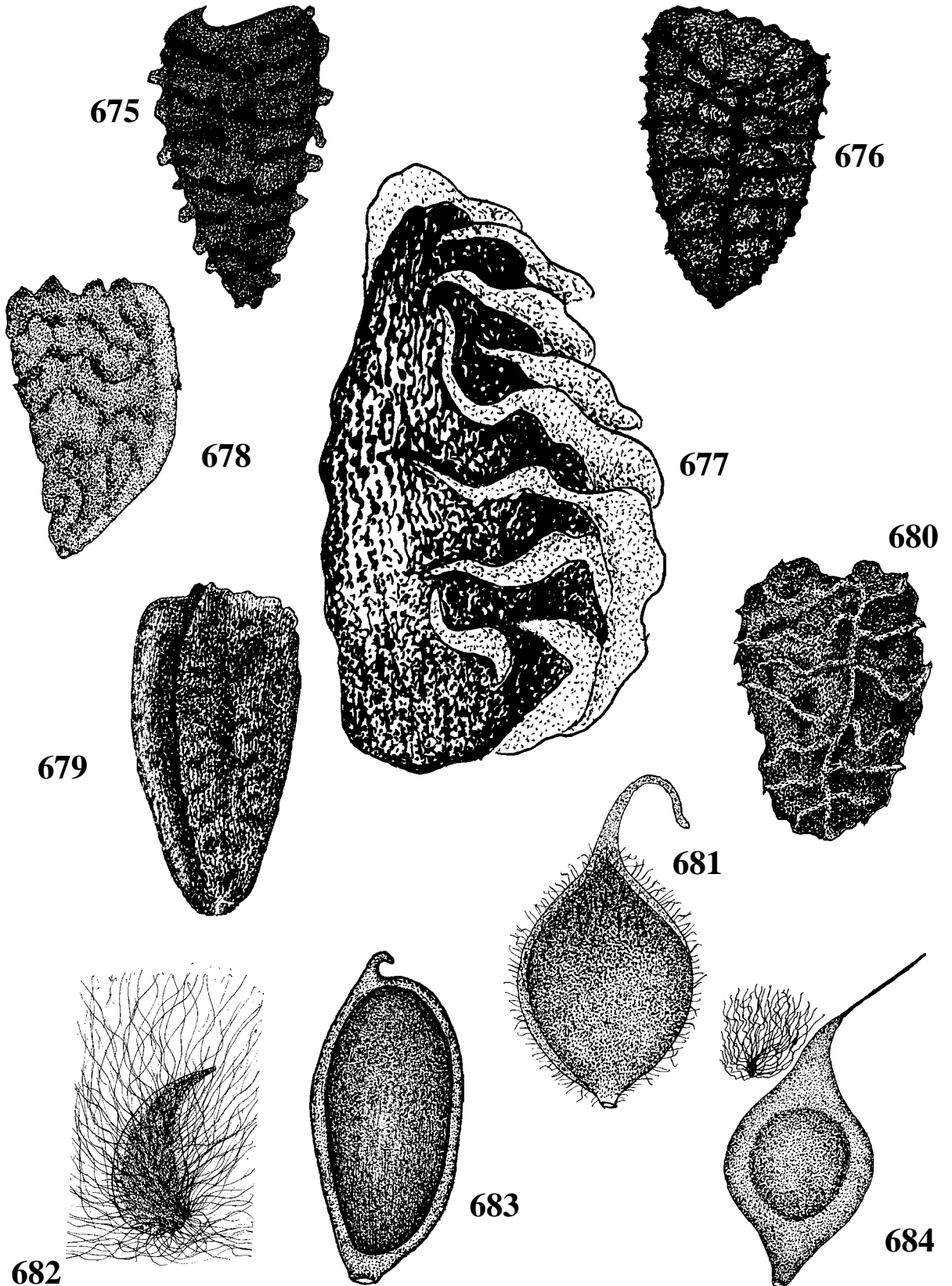
**681. *Anemone apennina*** L. — Perennial, stems erect, up to 20-25 cm high, flowering stems with 2 or 3 lobed leaves, 8-14 flower petals of violet colour, leaves hairy beneath, fruit headlets erect. **Fruits achenes, spherical, lateral slight compressed, with paler margin, beak present at the apex, 3-3.5 x 1.9-2.1 mm. Surface whitish fine hairy, especial at the margin and the upper half, lustreless, greenish-brown.** Native to southwestern Europe (the Apennines); introduced into the Carpathians and rarely naturalized in parks. Sk.

**682. *Anemone baldensis*** L., *Pulsatilla baldensis* Delarbre — Perennial, up to 5-20 cm high, stems erect, uniflower, hirsute. **Fruits achenes, sickle-shaped, lateral compressed, apex pointed, base broad, margin hemmed, 6-7 x 2.5-3 mm. Surface densely covered with dirty whitish hairs, dark-brown.** Native to western Europe and the Balkan Peninsula, in stony and grassy stands, in subalpine and alpine zones. Ro.

**683. *Anemone blanda*** Schott et Kotschy, *Anemonoides blanda* (Schott et Kotschy) Holub — Perennial, stems 30-40 cm high, numerous flower petals, overhanging fruit heads. **Fruits achenes, ellipsoid, biconvex, slight flattish, base narrowed into the hilum, beak nodose, 3.5-4.2 x 1.5-2 mm. Surface sparse pubescent, often with 1-3 deep and broad furrows on each side, slight lustrous, reddish-brown. 2n = 14, 16.** Native to the Balkan Peninsula; rarely cultivated in parks and gardens, uniquely naturalized.

**684. *Anemone coronaria*** L. — Perennial, up to 15-40 cm high. **Fruits achenes, ellipsoid to subglobular, flattish apex narrowed with the rest of a prolonged stylus, base also narrowed, 3.5-4.6 x 1.3-1.9 mm. Surface densely covered with long**





**whitish hairs, dull, pale-brown.  $2n = 16$ .** Native to southern Europe and central Asia; often cultivated in gardens for cutting flowers.

**685. *Anemone hortensis* L., *A. stellata* Lam.** — Perennial, stems 10-20 cm high, leaves lobed, flowers single, pink, violet or white. **Fruits achenes, obovoid, lateral compressed, apex narrowed into a terminal straight beak, 3.2-3.6 x 1.9-2.1 mm. Surface dull, brown, densely long-villous, hairs yellowish-white.  $2n = 16$ .** Native to the Mediterranean; in the Carpathians often cultivated in gardens as an ornamental plant.

**686. *Anemone japonica* (Thunb.) Siebold et Zucc., *Atragene japonica* Thunb.** — Perennial, up to 50-80 cm high, stems more or less branched. **Fruits achenes, ellipsoid, with long little curved beak at the apex and with truncate base, 2.4-3 x 0.8-1.1 mm. Surface covered with light yellowish woolly hairs, colour of the naked seed pale-brown.  $2n = 16$ .** Originally spread from eastern Asia; cultivated in gardens and parks as ornamental in many cvs and hybrids.

**687. *Anemone narcissiflora* L., *Anemonastrum narcissiflorum* (L.) Holub** — Perennial, up to 20-50 cm high, stems erect, hairy. **Fruits achenes, obovate or broad ellipsoidal, compressed, with more than 1 mm-wide wing, small whip at the apex, 6-8 x 5-5.6 mm. Surface fine structured, glabrous, goldish-brown, margin light.  $2n = 14$ .** Native to Euro-Siberia, in mountain moist ridges, pastures, plain meadows, humous and stony soils, from southern and central Europe to the Ural. Pl, Ro, Sk, Uk.

**688. *Anemone nemorosa* L., *Anemonoides nemorosa* (L.) Holub** — Perennial, up to 10-30 cm high, stems single, erect. **Fruits achenes, ellipsoid, flattish, lateral view biconvex, margin listed, apex gradually narrowed into curved beak (falcate persistent style), 4.2-5 x 1.8-2.4 mm. Surface lustreless, with longitudinal striations, downy yellowish or yellowish-brown.  $2n = 30$ .** Native to the mountains of the large part of Europe, in all kinds of woodlands and thickets, mostly in loamy soils; in the whole Carpathians.

**689. *Anemone pavonina* Lam.** — Perennial, up to 15-30 cm high, flowers scarlet, seldom pink. **Fruits achenes, obovoid-biconvex, margin broad hemmed, apex with terminal beak, 3.2-3.8 x 1.7-2 mm. Surface dense covered with dirty yellowish hairs.  $2n = 16$ .** Native to southern Europe;

in the Carpathians rarely cultivated in gardens as an ornamental, permanent plant. Sk.

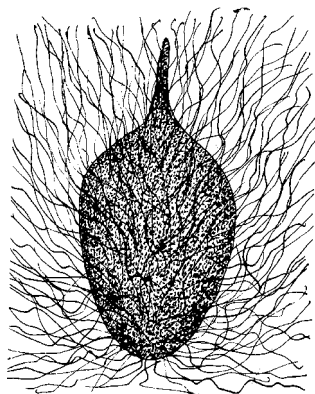
**690. *Anemone ranunculoides* L., *Anemonoides ranunculoides* (L.) Holub** — Perennial, up to 10-30 cm high, stems erect, glabrous, uniquely hirsute. **Fruits achenes, ellipsoid to circular, biconvex with a marginal list, apex rather abrupt narrowed into the beak, which is slight curved or tip-hooked, 3.2-3.8 x 2-2.4 mm. Surface lustreless, downy light nut-brown.  $2n = 32, 30-33$ .** Most of Europe, except islands, rare in the Mediterranean region, in moist deciduous woodlands and thickets; throughout Carpathians.

**691. *Anemone sylvestris* L.** — Perennial, up to 15-50 cm high, simple, rarely ramified, silverish bristle. **Fruits achenes, ellipsoid, obovate asymmetrical, slight biconvex, curved, lateral view flattish, marginal list distinct, beak present, 2.8-3.2 x 1.2-1.4 mm. Surface slight rough, quite enclosed with white woolly hairs up to 10 mm long, stigma black.  $2n = 16$ .** Native to central and eastern Europe, Asia and Siberia, in sunny, dry, open woodlands, semiarid turfs, thicket slopes; throughout the Carpathians, cultivated for ornament in gardens and rock-gardens.

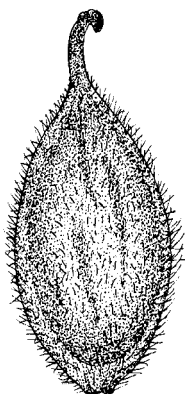
**692. *Anemone trifolia* L.** — Perennial, up to 10-40 cm high, rhizome creeping, stems upright, flowers white, seldom red or blue. **Fruits achenes, ellipsoid slight compressed, dorsal side convex, with one or two longitudinal ribs, ventral side flat or concave with one rib, beak present, recurved, 4.2-5 x 1.7-2 mm. Surface hirsute, dull, brown to nigrescent.  $2n = 32$ .** Native to the mountains of the Mediterranean, in light-shrubby forests on calcifugous soils. Hu.

**693. *Anemone vitifolia* Buch.-Ham.** — Perennial, stems 100-120 cm high, the beneath side of the leaves tomentose in some subsp., flowers pink or white. **Fruits achenes, ellipsoid, apex with long, terminal, recurved beak, 1.9-2.1 x 0.7-0.9 mm. Surface densely covered with long crisp, whitish hairs.** Native to eastern Asia; in the Carpathians planted mostly in parks, rarely in gardens (too-mighty).

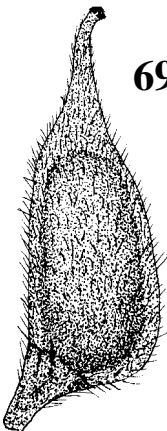
**694. *Hepatica nobilis* Schreb., *H. triloba* Gilib., *Anemone hepatica* L.** — Perennial, plant with a short rhizome, adventive roots and a rosette of leaves. **Fruits achenes, trullate-ovate, lateral view-biconvex, margin distinct listed, apex gradually narrowed into terminal, curved beak with**



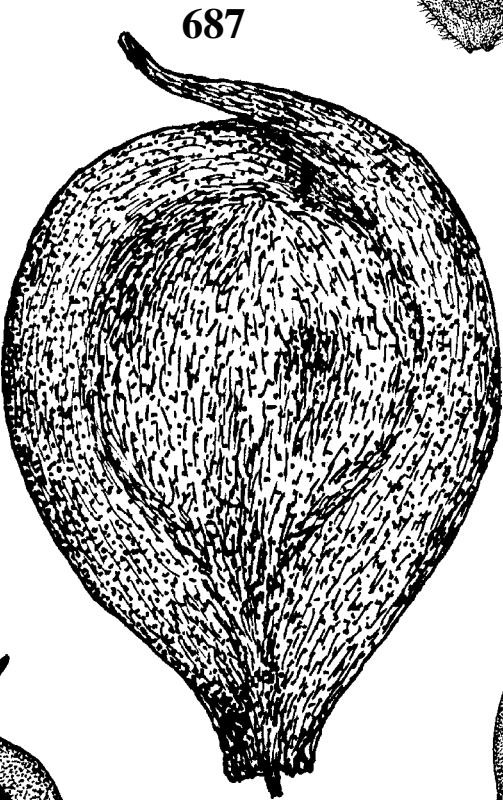
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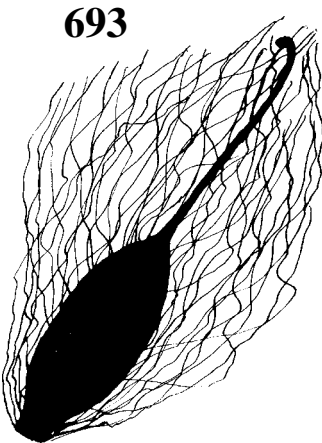
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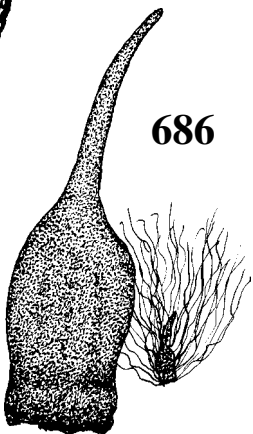
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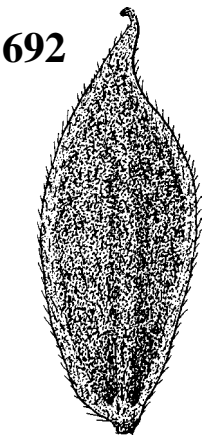
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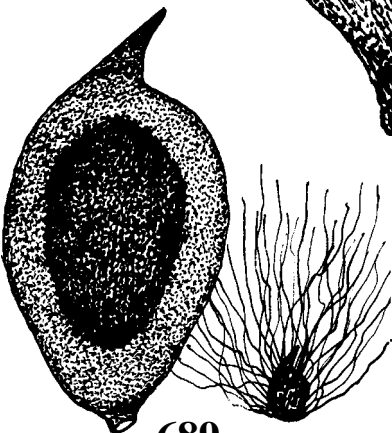
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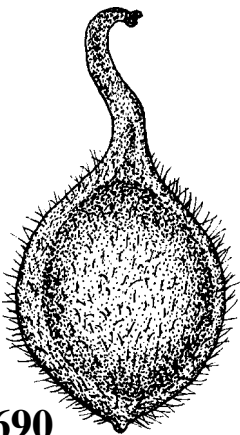
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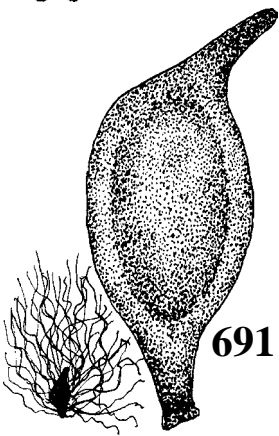
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stigma, 4.5-5 x 1.4-1.8 mm. Surface slight rough, light orange-yellow to orange, densely sericeous.  $2n = 14$ . Native to most of continental Europe, in shady, mostly deciduous, rarely coniferous woodlands; throughout the Carpathians.

**695. *Hepatica transsilvanica*** Fuss, *H. angulosa* DC. – Perennial, up to 10-20 cm high, similar to *H. nobilis*, but more robust, horizontal rhizome long. **Fruits achenes, cylindric, biconvex, margin distinct listed on one side only, apex gradually narrowed into terminal, straight beak, 5-6 x 2.2-2.5 mm. Surface slight rough, orange-yellowish, densely sericeous.  $2n = 28$ .** Native to Romania, in mountain, forest and shrubberies; sometimes cultivated as an ornamental plant in gardens; in the whole Carpathians.

**696. *Pulsatilla alba*** Rchb. – Perennial, stems unbranched, flower stems 15-35 cm high, leaves bare or hirsute, flowers white. **Fruits achenes, lanceolate, gradually narrowed on both ends, apex continues in terminal long beak (c. 3 cm), 4.1-4.5 x 0.9-1.1 mm. Surface of the achenes and beaks densely covered with whitish hairs.  $2n = 16$ .** Native to Europe, on high-mountain grassy and stony ridges. Ro, Sk, Uk.

**697. *Pulsatilla alpina*** (L.) Delarbre, *Anemone alpina* L. – Perennial, up to 20-45 cm high, stems unbranched. **Fruits achenes, lanceolate, gradually narrowed on both ends, apex continues into terminal long beak (c. 4 cm), 4-5 x 1.2-1.4 mm. Surface of the achenes and beaks brown, densely covered with whitish hairs.  $2n = 16$ .** Native to mountains of the Alps; often cultivated in rock-gardens in subsp. *sulphurea* (DC.) Aschers et Graebn.

**698. *Pulsatilla grandis*** Wender., *P. vulgaris* auct. non L. Hazsl. – Perennial, 10-30 cm high, with many-headed rhizome, flowering stems up to 50 cm. **Fruits achenes, very similar to those of *P. alba*, also with strong, long hirsute beak, 4.6-5.6 x 0.9-1.1 mm. Whole surface hairy, lustreless, grey.  $2n = 32$ .** Native to Europe, on sunny, turf, stony and rocky slopes, light shrubby forests in warmer areas; throughout the Carpathians.

**699. *Pulsatilla hungarica*** Soó, *P. pratensis* subsp. *hungarica* (Soó) Soó – Perennial, shorter in growth than *P. pratensis* and *P. zimmermannii*, flower petals dirty-violet from outside, greenish-yellow to yellowish grey-violet from inside. **Fruits achenes, spindleform, gradually narrowed on both sides,**

**apex with beak, c. 3.5 cm, 4.2-4.8 x 0.9-1.1 mm. Surface densely covered with long whitish hairs.  $2n = 16$ .** Native to Pannonia, on sandbanks, dry pastures. Hu, Ro, Sk.

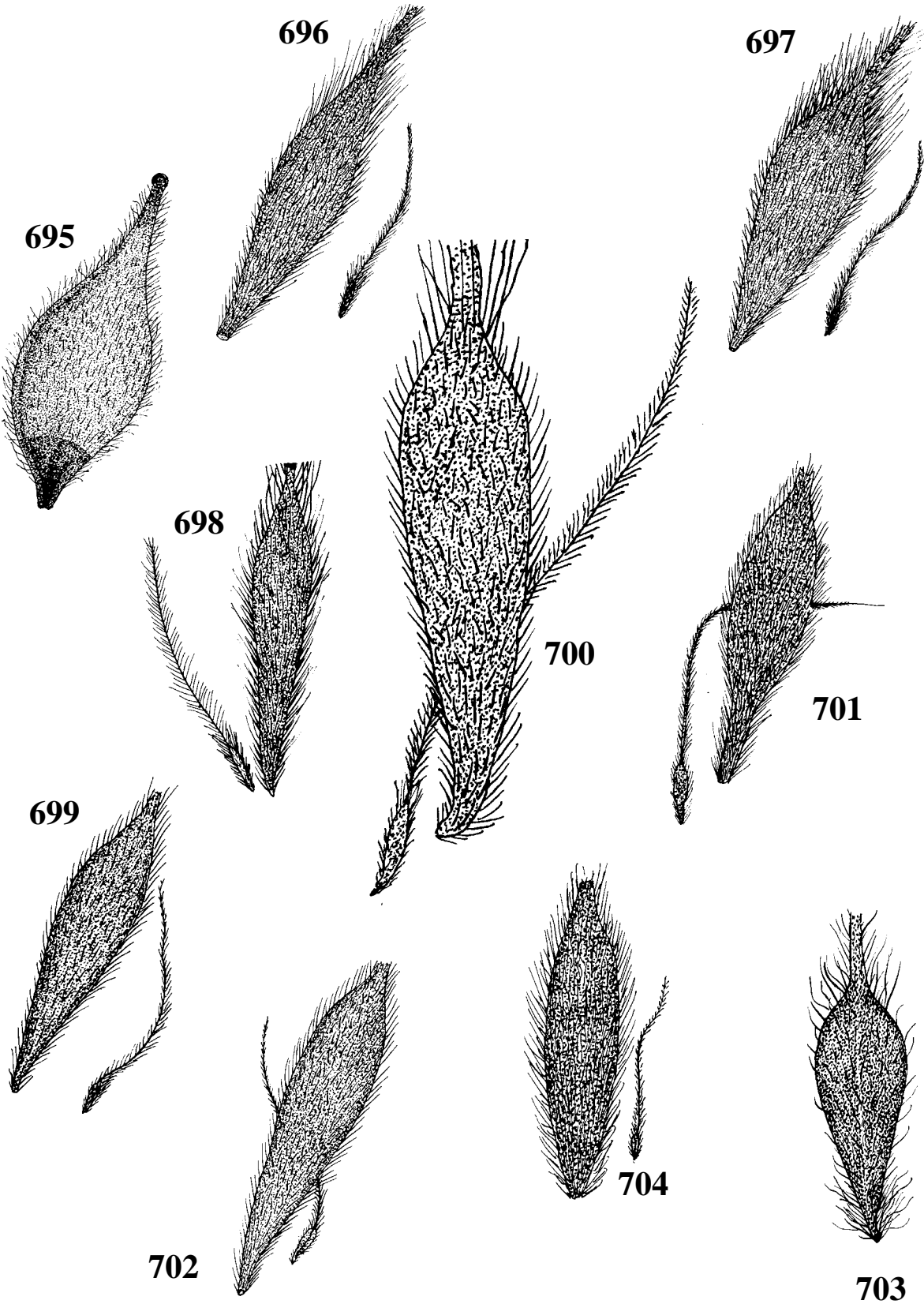
**700. *Pulsatilla montana*** (Hoppe) Rchb., *Anemone montana* Hoppe – Perennial, flowering stems up to 35 cm, non-flowering 5-20 cm high. **Fruits achenes, spindleform, bottom gradually narrowed with a curved terminal long beak, 4-5 x 1-1.3 mm. Surface strong sericeous all over.  $2n = 16$ .** Native to the mountains of southern Europe, on grassy hills. Br, Hu, Mo, Ro.

**701. *Pulsatilla nigricans*** Störck, *P. pratensis* subsp. *nigricans* (Störck) Zamels, *Anemone nigricans* Strasser – Perennial, stems 10-30 cm high, the plant flowers appearing after the leaves, flowers dark-violetish, 2-3 cm long, droopy, leaves 3x cutting. **Fruits achenes, spindleform, with long hirsute terminal, curved beak (c. 2 cm), 4-5 x c. 0.5 mm. All surface hairy, lustreless, grey.** Native to central Europe, on sandy stands, grassy and stony slopes. Hu, Mo, Sk, Uk.

**702. *Pulsatilla patens*** (L.) Mill., *Anemone patens* L. – Perennial, 5-15 cm, fertile stems up to 35 cm high, rhizome with yellow-green scale. **Fruits achenes, similar to those of *P. grandis*, 5.2-5.8 x 1-1.3 mm.  $2n = 16$ .** Native to eastern and eastcentral Europe, westwards to Sweden and Germany; in the Carpathians on sunny, turf, rocky slopes, sandbanks, in light pine forests. Br, Hu, Pl, Ro, Sk, Uk.

**703. *Pulsatilla pratensis*** (L.) Mill. – Perennial, 5-25 cm, fertile stems up to 40 cm high, rhizome many-headed, rough. **Fruits achenes, ellipsoid, narrowing abrupt the apex and gradually towards the bottom, long hirsute beak present (c. 2 cm), transverse section rounded, margin with longitudinal, obtuse list, 3.6-4 x 1.1-1.5 mm. Surface strong sericeous all over.  $2n = 16$ .** Native to central and eastern Europe, on dry, sunny, turf, stony or rocky slopes. Br, Hu, Pl, Ro, Sk.

**704. *Pulsatilla scherfelii*** (Ullepitsch) Skalický, *P. alba* auct. non Rchb. – Perennial, stems 15-40 cm high, unbranched, erect. **Fruits achenes, lanceolate, gradually narrowed on both ends, apex continuing into a long terminal beak (about 3.5 cm), 4.3-5 x 0.9-1.1 mm. Surface of the achenes and beaks yellowish-brown to brown, densely covered with whitish hairs.  $2n = 16$ .** Native to the mountains



of central Europe, on pastures over the upper forest boundary, usually calcifuge. Ro, Sk, Uk.

**705. *Pulsatilla slavica*** G. Reuss, *Anemone halleri* auct. non All. — Perennial, up to 5-7 cm, fertile stems up to 50 cm high, primary divisions of basal leaves usually 3. **Fruits achenes, similar to those of the other species of *Pulsatilla*, long terminal beak hirsute, about 3.5 cm long, 5-6 x 1-1.3 mm. 2n = 32.** A Carpathian endemic, on calcareous rocks with alkaline and humous soils, often cultivated in rock-gardens. Hu, Pl, Ro, Sk.

**706. *Pulsatilla subslavica*** Futák — Perennial, basal leaves in the flowering time under-developed, leaves broadly ovoid, longer than in *P. slavica*, when young felty, later on scarcely hairy. **Fruits achenes, prolonged obovoid, lateral flattish, apex with long, hairy beak (c. 3.5 cm), 5.2-5.8 x 1.3-1.5 mm. 2n = 32.** Native to the western Carpathians, on dryer grassy stands, calcareous places, from upland to mountain zones. Sk.

**707. *Pulsatilla vernalis*** (L.) Mill., *Anemone vernalis* L. — Perennial, 5-15 cm, fertile stems up to 35 cm high, rhizome short. **Fruits achenes, very similar to those of *P. patens*, beak about 3 cm long, 4.2-5 x 0.9-1.1 mm. 2n = 16.** Native to central Europe, from Scandinavia to Italy and Bulgaria, mostly in sandy soils and overgrown dunes of light-pine forests. Br, Pl, Sk.

**708. *Pulsatilla zimmermannii*** Soó, *P. montana* auct. non (Hoppe) Rchb. — Perennial, up to 30 cm high, flowering stems semiupright. **Fruits achenes, lanceolate, gradually narrowed on both ends, apex prolonged into a beak (c. 2.5 cm long), 3.8-4.5 x 0.9-1.2 mm. Surface of the achenes and beaks brown, dense covered with long whitish hairs. 2n = 16.** Native to Pannonia, on sunny and dry steppe slopes with rocky or stony grounds, in the montane zone. Br, Hu, Mo, Ro, Sk.

**709. *Clematis alpina*** (L.) Mill., *Atragene alpina* L. — Shrub, stems trailing, woody, 1-3 m high. **Fruits achenes, obovate-obtrullate, lateral view flattish, transverse section elliptic, margin listed, faces convex, beak terminal up to 4 cm long, 4-4.6 x 2.4-2.7 mm. Surface sparse long pubescent, more dense at the apex and beak, achenes nut-brown. 2n = 16.** Native to the northern and mountain area of central Europe, on overgrown rocks, in light shrubberies, woods. Hu, Pl, Ro, Sk.

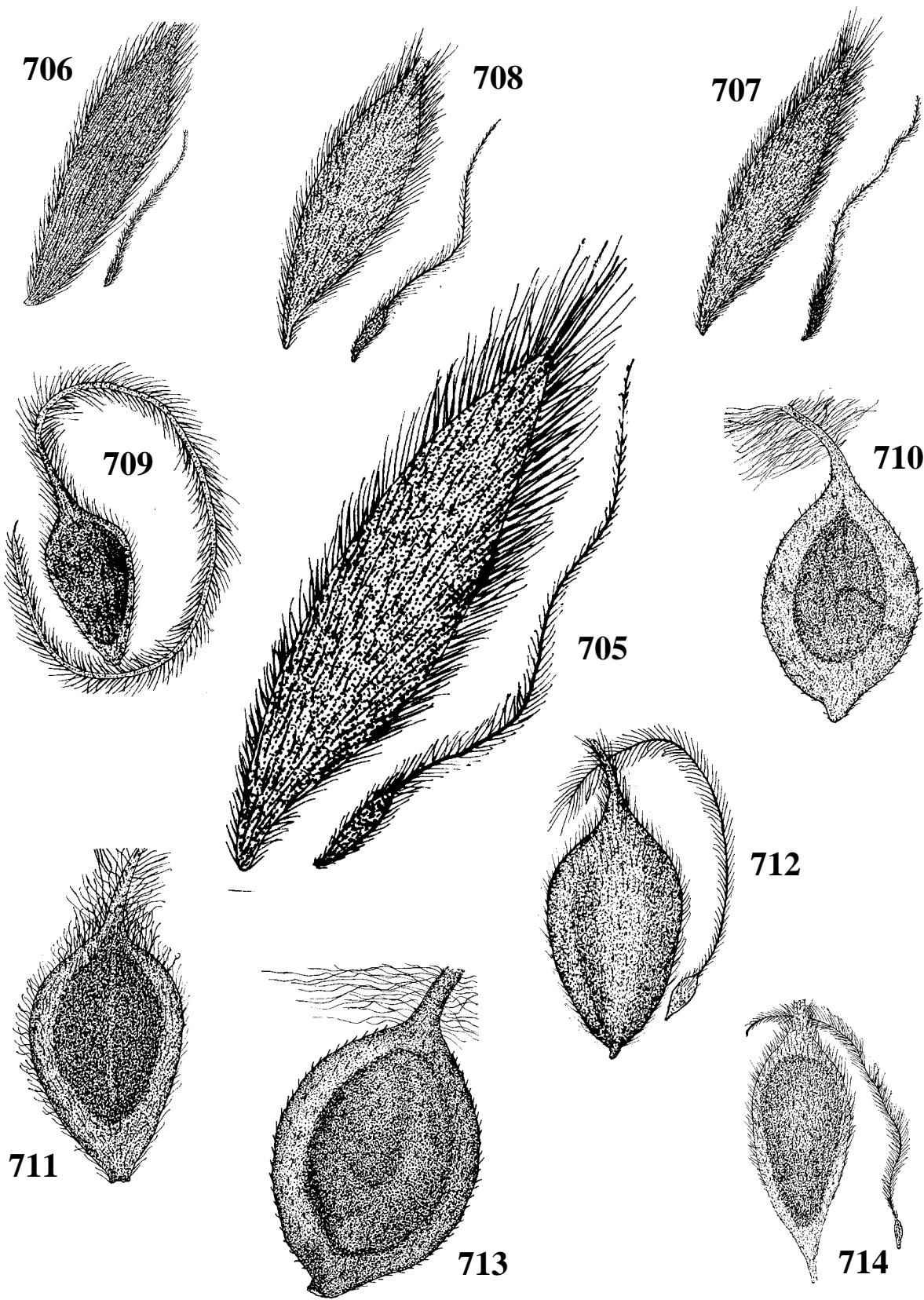
**710. *Clematis flammula*** L. — Perennial, semishrub, stalks 3-5 m long, bottom wooden, herbaceous above, climber. **Fruits achenes, flattish, narrow ovoid, with a prominent margin and  $\pm$  2 cm long feathery beak, 5.4-5.8 x 3.5-4.5 mm. Surface pubescent, brown. 2n = 16.** A Mediterranean element of southern Europe and western Asia, in juniper-tree forests, clearings, cultivated in parks and gardens, rarely naturalized. Hu, Ro, Uk.

**711. *Clematis integrifolia*** L. — Perennial, stems 30-70 cm high, stiff erect, simple or with some short branches. **Fruits achenes, prolonged obovate, flattish, with a bowly bended c. 4-5 cm long beak and a distinct margin, 6-7 x 3.5-4 mm. Surface brown, margin paler, all covered with white hairs. 2n = 16.** Native to central and southeastern Europe as far as Russia, on moist, in summer dry meadows, forest clearings, shrubberies and slopes; in the whole Carpathians.

**712. *Clematis orientalis*** L. — Liana, up to 6 m high, leaves feathery, leaflets oval to oboval or lanciform, 1.5-5 cm long, flowers from 4 yellowish, from outdoors reddish cup-leaves. **Fruits achenes, obovoid, lateral compressed, margin roughen, bottom narrowed, long beak present, 2.5-3 x 1.3-1.5 mm. Surface densely hairy, dull, brown, beak densely covered with long hairs.** Native to the Crimea, Caucasus, Asia; in the Carpathians cultivated as very ornamental in gardens and parks.

**713. *Clematis recta*** L. — Perennial, up to 1-1.5 m high, stems erect, non-trailing, ramified, downy in the upper part. **Fruits achenes, ellipsoidal to globular, compressed with a rough margin hem, beak present (c. 1-2 cm), 5-6 x 3-3.6 mm. Surface wrinkly, feathery pubescent, reddish-brown, beak fine hairy. 2n = 16.** Native to Europe, in light woodlands, forest steppes, shrubby slopes, overgrown rocks, forest margins, in warmer areas. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**714. *Clematis tangutica*** (Max.) Korsh. — Woody climbers up to 3 m long, flowers mostly simple, large, yellow. **Fruits achenes, obovate with long, bottom gradually narrowed, densely hairy beak, 4.8-5.2 x 1.8-2.1 mm. Surface waved, covered with long hairs, yellowish-brown.** Native to China and Mongolia; in the Carpathians rarely cultivated in parks, seldom naturalized.



**715. *Clematis vitalba* L.** — Shrub, stems woody climber up to 30 m long, at base up to 5 cm in diam., 4-angled. **Fruits achenes, scarce compressed, obovate, at base and apex narrowed, beak up to 2-4 cm long, densely hairy, 3.5-5 x 1.8-2.5 mm. Surface faces fine ribbed, hairy, dark-brown. 2n = 16.** Originally a forest species of Europe, Asia and northern Africa, in valley woodlands, borders of woods, thickets, hedgerows; in the whole Carpathians.

**716. *Clematis viticella* L.** — Perennial (shrub), up to 3-4 m high, stem woody at the bottom, climber with violet or red flowers. **Fruits achenes, subspherical, proper achenes with a prominent broad margin, flattish apex narrowed into a short recurved beak, 8-9.5 x 6.5-7.5 mm. Surface wrinkly, very fine hairy, reddish- to dark-brown. 2n = 16.** Native to the eastern Mediterranean; often cultivated in gardens, near hedges and walls, in many cvs and hybrids. Hu, Ro, Sk.

**717. *Clematis x jackmannii* T. Moore** — Perennial, up to 3 m high, stems trailing with attractive dark blue-violet flowers. **Fruits achenes, ellipsoidal, compressed, fine hairy, 2-2.5 cm long beak, 4-5 x 6-7 cm. Surface dull, fine hairy, dark-brown. 2n = 16.** Species of hybrid origin (*C. viticella* L. x *lanuginosa* Moore); for its attractiveness, often cultivated in parks and as a hedge plant; in the whole Carpathians.

**718. *Ceratocephala falcata* (L.) Cramer, *Ranunculus falcatus* L.** — Annual, plant up to 2-10 cm high, pubescent. **Fruits achenes with a long, broad, falcate beak and empty cells, distant, with a rather broad groove between the empty cells above, 4.2-5.5 x 1.1-1.5 mm. Surface smooth or loose hairy, dirty greyish-brown, beak pale-brown. 2n = 40.** Native to Europe, Asia Minor, southwestern Asia, on dry hills in lowlands, in fields and waste places. Hu, Mo, Ro, Sk, Uk.

**719. *Ceratocephala orthoceras* DC., *Ranunculus testiculatus* auct. non Crantz** — Annual, up to 2-10 cm high, stem less hairy, without foliage, cobwebby lanate, one-flowered. **Fruits achenes with broad falcate beaks and empty cells on each side, 3.5-4.5 x 1.3-1.7 mm. Surface smooth or faint hairy, dirty grey-brown. 2n = 14, 40 (?).** Native to Europe and central Asia, on steppes, dry slopes, waste places, tilled fields. Hu, Mo, Pl, Ro, Sk, Uk.

**720. *Ficaria bulbifera* Holub, *F. verna* auct. non Huds.** — Perennial, stems 5-40 cm, ramified, procum-

bent, with ascendent ends, rooting at inferior knots. **Fruits achenes, ovate, nearly rounded, apex pointed, keeled around seeds, 2.9-3.3 x 1.7-1.9 mm. Surface pubescent hairy, light-yellow, bottom part brown. 2n = 32, 48.** An Eurosiberian element, in lowlands and wet forests, meadows, ravines, mostly in shady places; throughout the Carpathians.

**721. *Ranunculus aconitifolius* L.** — Perennial, up to 20-70 cm high, stems roundish, upright, ramified. **Fruits achenes, nearly rounded, slight flattish, margin suture sharp, with a very slender curved beak, 3.5-4.5 x 3-3.4 mm. Surface glabrous, indistinct veinous, yellowish-green to yellowish-brown. 2n = 16.** An European element, in moist to wet, nutrient-rich soils, meadows, woods, brookbanks. Ro, Uk.

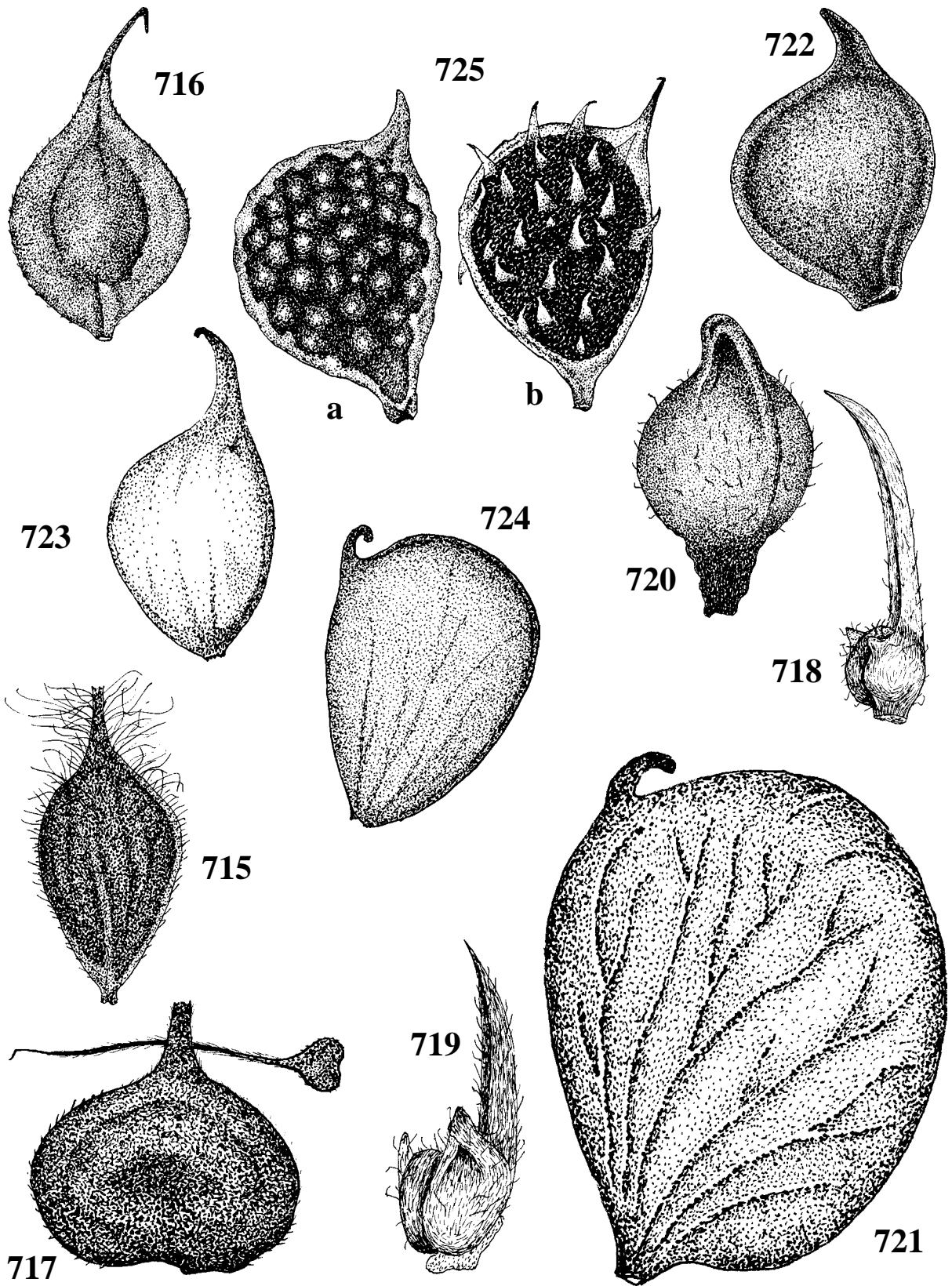
**722. *Ranunculus acris* L.** — Perennial, bare or sparsely appressed-hirsute, stems erect, 30-70 cm high, branched, multiflowered. **Fruits achenes, ± spherical, with a narrow margin, lateral compressed, slight biconvex, apex with a short curved beak, 2.2-2.8 x 1.5-2 mm. Surface fine waved, slight lustrous, brown to blackish-brown, margin pale-brown.** Native to Eurasia, on meadows, pastures, forest clearings, disturbed grounds in neutral to slight acid soils, from lowland to subalpine zones; throughout the Carpathians.

**723. *Ranunculus alpestris* L., *R. traunfellneri* auct. non Hoppe** — Perennial, 5-12 cm high, caespitose, stems erect, glabrous, sulcate, 1-3 flowered. **Fruits achenes, obovoid, flattish, biconvex, margin narrow, slender, recurved beak, nearly straight, 2.3-2.7 x 1-1.4 mm. Surface glabrous, yellowish-brown. 2n = 16.** Native to the European mountains, on finer screes, rocky slits, snow deck-chairs. Pl, Ro, Sk.

**724. *Ranunculus amplexicaulis* L.** — Perennial, stems 15-30 cm high, basal leaves ovate-lanceolate, flowers white with a yellow centre. **Fruits achenes, obovoid, lateral compressed, inflated, on upper part with recurved beak, on margin with narrow wing or without it, 3-3.4 x 3.1-2.4 mm. Surface veinous, glabrous, lustreless, ochreous.** Native to the Kyrenees mountains, calcifuge; in the Carpathians cultivated in flowerpots, or in gardens in shady places.

**725. *Ranunculus arvensis* L.** — Annual, more or less pubescent, stems erect, 15-60 cm high, branched, multiflowered. **Fruits achenes, ± rounded, lateral**





compressed, margin hemmed, with a slight curved beak on the apex, bottom narrowed, 5-6 x 3-4 mm. Surface in *var. arvensis* without spines (a), in *var. tuberculatus* (Kit.) Koch verrucose, spiny (b), lustreless, brown.  $2n = 32$ . Native to Eurasia, field weed, especially in winter cereals, in moister sand-loamy and chalky soils; in the whole Carpathians, in warmer territories.

**726. *Ranunculus asiaticus* L.** — Perennial, stems 7-40 cm high, felty, leaves 3-numerous or undivided, flowers 3-5 cm in diam., white, yellow or red. **Fruits achenes in a leathery, semitransparent cover, with a stronger margin, apex acuminate into curved or recurved beak, 4.5-5.8 x 3.1-3.7 mm. Proper seeds cylindrical or obovoid, lateral compressed, brown.  $2n = 16$ .** Native to southwestern Asia; in the Carpathians cultivated sometimes in gardens in full-flower forms.

**727. *Ranunculus auricomiformis* Soó, *R. auricomus* L. em. W. Koch** — Perennial, 20-40 cm, densely caespitose, stems erect, ramified, glabrous or dispersed hirsute. **Fruits achenes, obovate with distinct margins, lateral view biconvex, recurved beak present, 2.8-3.3 x 1.8-2.4 mm. Surface sparse pubescent, yellow, light-brown to orange.  $2n = 16, 24, 32, 40, 48$ .** Native to Europe, western Asia and Siberia, common in woods, clearings, on meadows, occasionally on rocks; throughout the Carpathians.

**728. *Ranunculus bulbosus* L.** — Perennial, 20-50 cm high, stems bulbously roughened at base, pubescent, with leaves sheath wrapped up. **Fruits achenes, obovate, lateral view flattish, margin keeled and grooved, beak short, slight curved, 3.2-4 x 1.8-2.4 mm. Surface red- to black-brown.  $2n = 16$ .** Indigenous to the European mountains, western Asia and northern Africa, on semiarid turf, meadows, roadsides verges. Br, Hu, Pl, Ro, Sk, Uk.

**729. *Ranunculus carpaticus* Herbach, *R. dentatus* (Baumg.) Freyn** — Perennial, 15-40 cm high, stems erect  $\pm$  non-ramified, appressed pubescent. **Fruits achenes, broad obovate, flattish, lateral view biconvex, beak at apex curved or recurved, 2.8-3.2 x 1.8-2 mm. Surface pubescent, fine waved, light or yellowish-brown.  $2n = 16$ .** Native to the Carpathian mountains, in calcareous areas. Pl, Ro, Sk, Uk.

**730. *Ranunculus cassubicus* L.** — Perennial, 20-60 cm high, robust, stems furrowed, usually

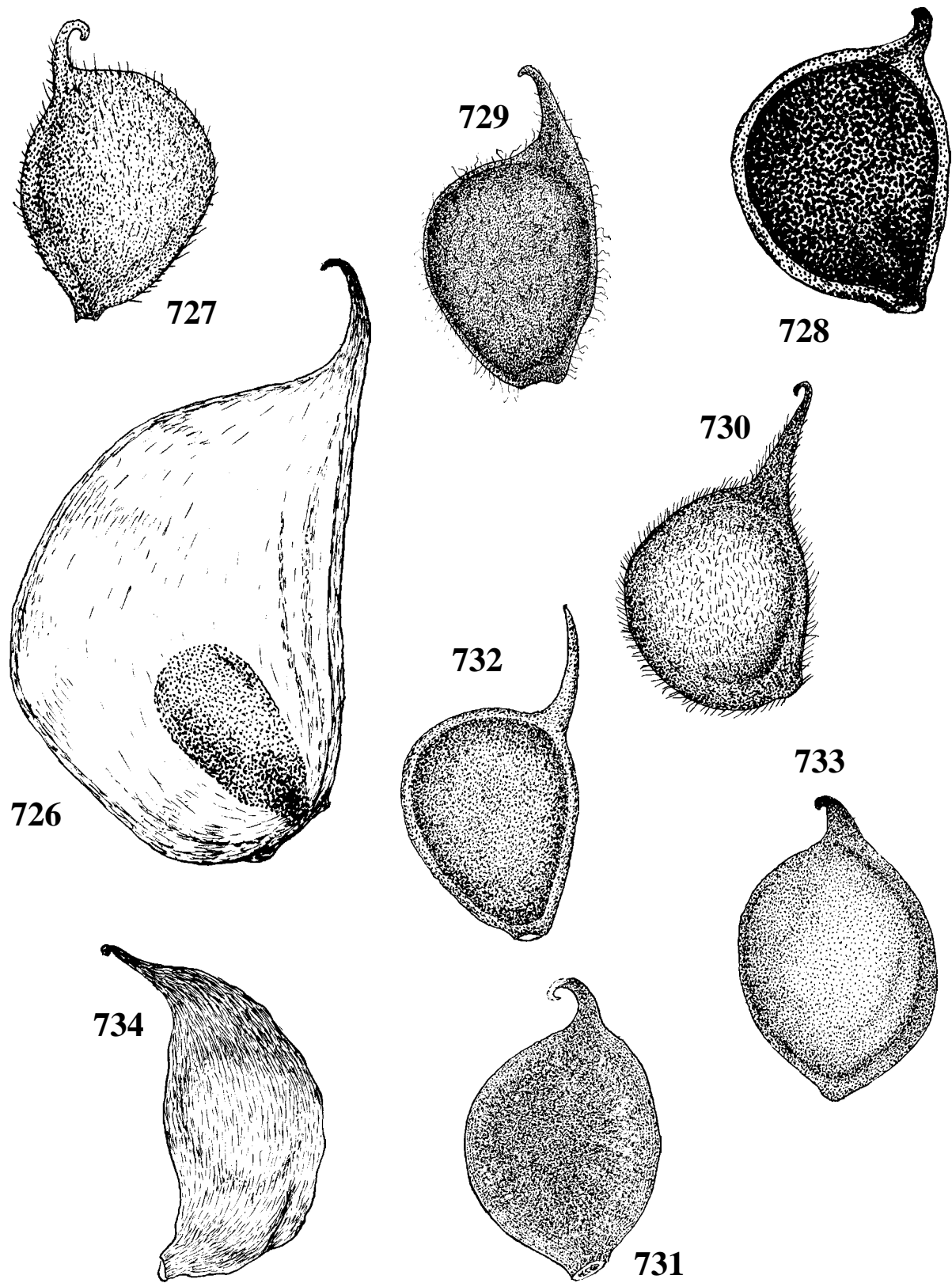
branched on the upper part. **Fruits achenes, obovate, biconvex, transverse section elliptic, margin distinct, beak long, curved or recurved, up to 2 mm long, 2.8-3.4 x 2.4-2.6 mm. Surface sericeous, orange-yellow to orange-brown.  $2n = 24, 32, 40, 44, 64$ .** Indigenous to eastern Europe, western Siberia, in clearings of mixed and deciduous forests, lowlands and hills, shrubberies; throughout the Carpathians.

**731. *Ranunculus constantinopolitanus* (DC.) D'Urv.** — Perennial, about 45 cm high, densely patent-pubescent below, appressed-pubescent above. **Fruits achenes,  $\pm$  rounded, lateral compressed, margin suture sharp, with recurved beak on apex, c. 1 mm long, 5.2-6 x 3.5-3.7 mm. Surface fine waved, faint lustrous, pale-brown, margin drab.** Native to southeastern Europe, in lowland damp shady woods. Ro, Uk.

**732. *Ranunculus crenatus* Waldst. et Kit., *R. vaginatus* Somm.** — Perennial, up to 5-24 cm, stems glabrous, simple (rare 2), with 1-2, seldom 3 flowers. **Fruits achenes, obovate, biconvex, slight compressed, margin all around with very narrow hem, apex with a long straight or slight curved beak, 1.7-2.2 x 1.3-1.6 mm. Surface glabrous or slight wrinkly, dull, whitish.** Native to the Alps, Carpathians and the Balkan Peninsula mountains, on grassy, stony, rocky slopes up to 1800 m elevation, calcicole. Ro.

**733. *Ranunculus flammula* L.** — Perennial, 5-80 cm high, stems erect, or creeping and rooting at the nodules, hollow, ramified, glabrous. **Fruits achenes, obovate or elliptic, slight biconvex, margin obscure listed all round, apex rounded with short curved beak, 1.5-1.8 x 1-1.2 mm. Surface smooth or distinct reticulate, light-yellow to buff-brown.  $2n = 32$ .** An Eurosiberian species, common in wet, boggy places, meadows, water reservoirs banks; in the whole Carpathian territory.

**734. *Ranunculus glacialis* L., *Beckwithia glacialis* (L.) Á. et D. Löve** — Perennial, 5-20 cm high, stems stout, erect or ascending, glabrous. **Fruits achenes, falcate, compressed, surrounded with a membranous pericarp, at apex elongated into a beak, 1-2 mm long, 3.2-4 x 1.5-3 mm. Surface glabrous, longitudinal striate, pale orange-yellow.  $2n = 16$ .** An Eurasian arctic-alpine species, wet slits of rocks, reinforced wet screes. Pl, Ro, Sk.



**735. *Ranunculus gramineus* L.** — Perennial, glabrous or pubescent stems 20-50 cm high, basal leaves linear to lanceolate, flat sessile, flowers deep yellow. **Fruits achenes, ellipsoid, slight compressed, keeled on apex with small straight beak, 3.5-3.9 x 1.8-2.2 mm. Surface veinous, fine reticulate-areolate, faint lustrous, ochreous or pale-brown.** Native to southwestern Europe, in mountain regions; in the Carpathians cultivated in rock-gardens as an attractive species.

**736. *Ranunculus illyricus* L.** — Perennial, 25-50 cm high, the whole plant appressed-sericeous, stems erect, ramified. **Fruits achenes, circular-rhombic, strong compressed, beak triangular, tip acute near straight, membranous about as long as achene, margin winged around, 2.7-3.4 x 2.2-2.9 mm. Surface glabrous, barely lustrous, fine reticulate, light orange-yellow. 2n = 32.** A Pontic-Pannonian species, on dry turf and stony slopes, grassy steppe slopes, calcicole; in the whole Carpathians.

**737. *Ranunculus lanuginosus* L.** — Perennial, 30-100 cm high, stems rough, erect, much ramified, densely hirsute. **Fruits achenes, obovate, slight biconvex, lateral view flattish, acute recurved beak present, 3.4-4 x 2.4-2.8 mm. Surface fine reticulate, grey nut-brown. 2n = 28 (32).** Native to Europe, in mixed and deciduous woodlands, shrubberies, in chalky, loamy soils; in the whole Carpathian territories.

**738. *Ranunculus lateriflorus* DC., *R. nodiflorus* G. Reuss, *Buschia lateriflora* (DC.) Ovczin.** — Annual, up to 20-30 cm high, glabrous, bifurcate or divaricate above, much branched. **Fruits achenes, obovoid, biconvex, slight flattish, with a narrow margin all-round, apex with a long slight curved beak, about as long as the achene, 2.3-2.7 x 1-1.2 mm. Surface glabrous, scattered, rough verrucose, dark-brown, margin pale-brown.** Native to southern Europe and southwestern Asia, on marshy, alternate flooded and drying out areas. Hu, Ro, Sk, Uk.

**739. *Ranunculus lingua* L.** — Perennial, 50-150 cm high, stems erect, vigorous, hollow, glabrous, much branched on top. **Fruits achenes, ellipsoid, membranous margin listed around, apex gradually tapered into a straight curved beak, 3.6-4.2 x 1.7-2.3 mm. Surface minute pitted, with appressed bristles, pale orange-yellow. 2n = 28, 64, c. 112, 128.** Most of Europe, rare in Mediterranean, along margins of stag-

nant waters, reed beds, wet and logged places, waste banks margins; in the whole Carpathians.

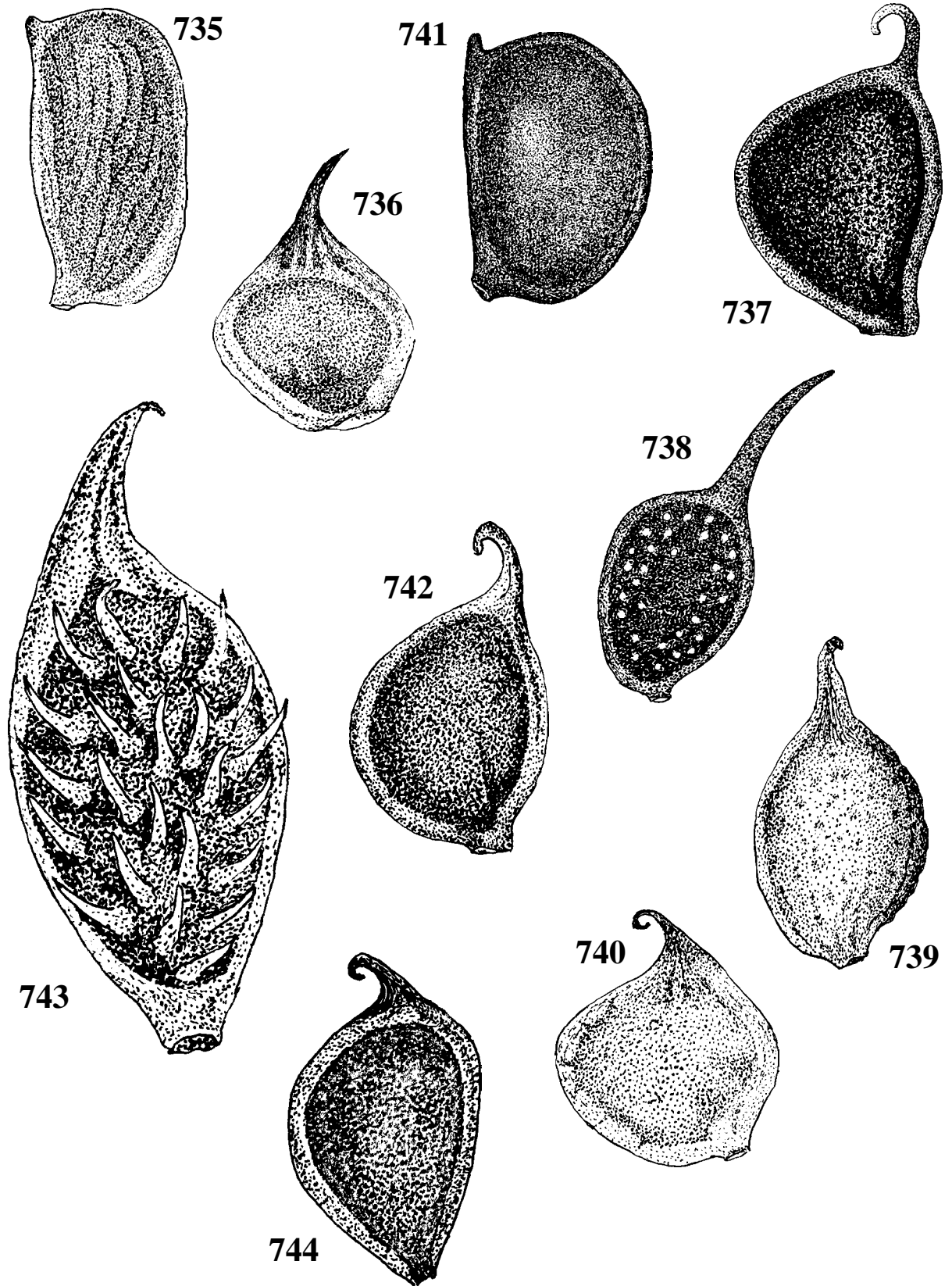
**740. *Ranunculus millefoliatus* Vahl, *R. garganicus* Ten.** — Perennial,  $\pm$  pubescent, stems up to 50 cm high, often branched, basal leaves 2- to 3-pinnatisect, with linear-lanceolate acute lobes. **Fruits achenes, oval on ellipsoid, lateral compressed, with a recurved beak at the apex, 2.7-3 x 2.4-2.7 mm. Surface fine waved, lustreless, ochreous.** Native to southern and eastcentral Europe, on grassy stands. Ro, Sk.

**741. *Ranunculus monophyllus* Ovcz.** — Perennial, stems up to 20-25 cm high, slender, sparsely and shortly pubescent. **Fruits achenes,  $\pm$  ellipsoid, lateral compressed, biconvex with a distinct margin suture, 1.7-1.9 x 1.4-1.6 mm. Surface fine waved, lustrous, dark orange-brown. 2n = 32.** Native to eastern Europe, rarely and transiently hauling into the Carpathians.

**742. *Ranunculus montanus* Willd., *R. geraniifolius* Schinz et Thell. non Pourr.** — Perennial, stems 10-30 cm high, simple or little ramified, glabrous, exceptionally pubescent. **Fruits achenes, spherical or ovoid, lateral compressed, narrow wing at the apex with a recurved beak, 2.6-3.2 x 1.8-2.3 mm. Surface glabrous, lustreless, reddish-brown, wings pale-brown. 2n = 16.** Native to Europe, on granite overgrown rocks, to subalpine and alpine zones. Pl, Ro, Uk.

**743. *Ranunculus muricatus* L.** — Annual, up to 50 cm high, glabrous, stems procumbent, ascendent or erect, branched. **Fruits achenes, prolonged ellipsoid, strong compressed, circumference keeled around, side faces spinose, apex with a strong and long, slight curved beak, 7-8 x 3-3.5 mm. Surface slight lustrous, verrucose, dark, margin pale-brown. 2n = 32, 48, 64.** Native to the Mediterranean, in damp localities; rarely hauling into the Carpathians. Mo, Ro, Uk.

**744. *Ranunculus nemorosus* DC., *R. tuberosus* Lapeyr.** — Perennial, up to 20-80 cm high, stems hairy below, ramified. **Fruits achenes, obovate, compressed, with a strong recurved beak, biconvex, margin listed around, 3.5-4 x 2.2-2.5 mm. Surface smooth brown to dark-brown. 2n = 16.** Most of Europe, except the north and the extreme south, in forest clearings, meadows, shrubberies. Br, Mo, Pl, Ro, Sk.



**745. *Ranunculus ophioglossifolius*** Vill. — Annual or perennial, up to 30-50 cm high, stems erect or ascendent, flexible, glabrous or hirsute. **Fruits achenes, obovate, slight biconvex, margin narrow listed around, apex with a short, blunt, curved beak, 1.5-1.7 x 1-1.2 mm. Surface rough verrucose, dull, dark-brown. 2n = 16.** Native to southern Eurasia, in wet grassy and logged localities, rare. Ro, Uk.

**746. *Ranunculus oreophilus*** M. Bieb., *R. villarsii* DC., *R. breyninus* Crantz — Perennial, 5-30 cm high, stems erect,  $\pm$  non-ramified, pubescent. **Fruits achenes, broad obovate-cuneate, compressed, biconvex, margin listed around, apex sudden tapered into a very short, recurved beak, 2.8-3.2 x 2.1-2.5 mm. Surface fine pitted, yellow-green to brown, margin pale. 2n = 16.** Native to the mountains of central and southern Europe, on rocky igneous slopes. Pl, Ro, Uk.

**747. *Ranunculus pedatus*** Waldst. et Kit. — Perennial, stems erect, glabrous, 15-30 cm high, little branched, poorly flowered. **Fruits achenes, obovoid, lateral compressed, surrounded with a broad wings, apex with a recurved beak, 2-2.6 x 1.7-2.3 mm. Surface waved, glabrous, slight lustrous, dark-brown, wings pale-brown. 2n = 16.** Native to Eurasia, in grassy, sunny places, weakly alkaline grounds. Hu, Mo, Ro, Sk, Uk.

**748. *Ranunculus platanifolius*** L., *R. aconitifolius* subsp. *platanifolius* (L.) Rikli — Perennial, 50-120 cm high, stems erect, hollow, blunt angular below knots. **Fruits achenes, asymmetrical rounded, slight compressed, biconvex, widest in the middle apex and base abrupt tapered, slender curved to recurved beak present, 3.7-4.3 x 3-3.8 mm. Surface glabrous, distinct veinous, yellow-green to orange-brown. 2n = 16.** Native to European mountains, in scree forests, *Pinus mugo* clearings. Pl, Ro, Sk, Uk.

**749. *Ranunculus polyanthemus*** L. — Perennial up to 30-130 cm high, stems erect, much branched, appressed hirsute. **Fruits achenes, obovate, margin list with a distinct rim, widest at abrupt apex, straight slight curved beak at the apex, 2.3-3.1 x 1.8-2.5 mm. Surface indistinct reticulate, brown to black-brown. 2n = 16.** An Eurasian boreal species, in light deciduous forests, shrubberies and meadows; in the whole Carpathians.

**750. *Ranunculus pseudomontanus*** Schur, *R. montanus* auct. non Willd. — Perennial, up to 15-50 cm

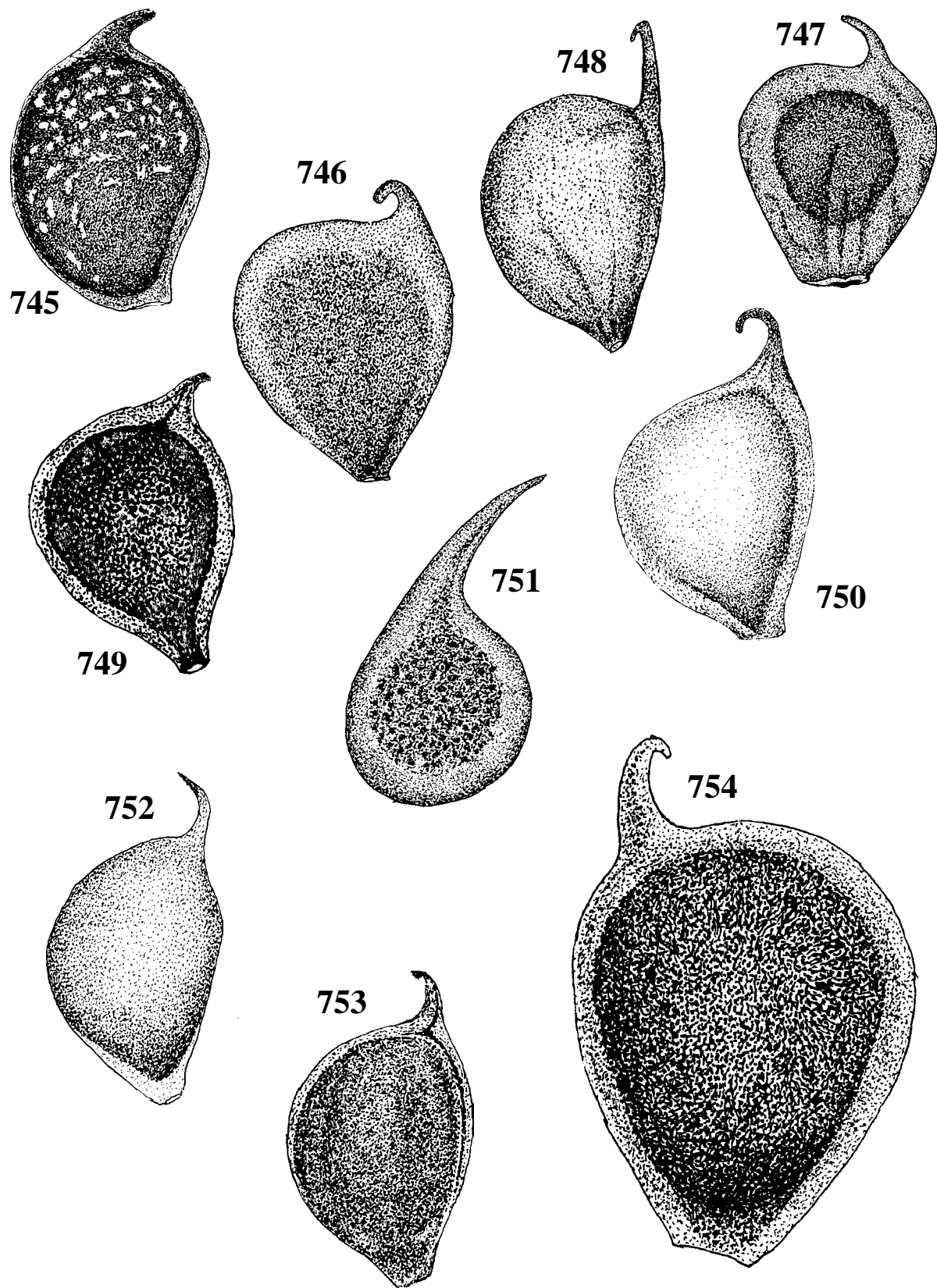
high, stems erect, unbranched, hirsute. **Fruits achenes, broad obovate-cuneate, compressed, biconvex, margin keel, apex sudden tapering into a very short recurved beak, 3.5-4 x 2.2-2.5 mm. Surface faint lustrous, fine verrucose, pale to greyish-brown. 2n = 16.** Native to Balkan and eastern Europe, on granite overgrown rocks and screes. Pl, Ro, Sk.

**751. *Ranunculus psilostachys*** Griseb. — Perennial, stems simple or little branched, with fusiform tubers. **Fruits achenes, spherical, strong compressed, with broad hem around, beak slight curved, as long as the achene, 3-3.4 x 1.5-1.7 mm. Surface fine verrucose, faint lustrous, pale-brown. 2n = 32.** Native to the Balkan Peninsula; in the Carpathians very rare. Hu.

**752. *Ranunculus pygmaeus*** Wahlenb. — Perennial, 2-7 cm high, nearly glabrous, stems simple, erect or ascending, uniflorous. **Fruits achenes, ovoid, lateral view compressed, biconvex, margin indistinct, beak subterminal, curved, 1.2-1.6 x 0.8-1 mm. Surface glabrous, lustreless, yellow to yellowish-green. 2n = 16.** Glacial relict of arctic and subarctic Europe, Siberia and North America, in rocky slits, snow lying, reinforced tiny screes, with humous and not chalky foundations. Pl, Sk.

**753. *Ranunculus repens*** L. — Perennial, glabrous or somewhat pubescent, up to 30-50 cm high, stems procumbent, ends ascending, knots rooted. **Fruits achenes, obovate-elliptic, strong compressed, biconvex, margin distinct, apex narrowed into a short curved beak, 2.7-3.3 x 1.8-2.2 mm. Surface lustreless, smooth or fine reticulate, orange-brown. 2n = 16, 24, 32.** Native to Eurasia, form lowlands to the subalpine zones, weed on damp fields, meadows, gardens, verges, woodlands; in whole Carpathians, full-blossom forms are cultivated on banks of water reservoirs and flower-beds.

**754. *Ranunculus sardous*** Crantz subsp. *sardous* — Annual or overwintering, stems 10-40 cm, densely patently hirsute, later on bare, erect, much branched, a numerous flowers. **Fruits achenes, obovoid, lateral compressed, with winged margin and recurved beak on apex, 2.8-3.2 x 2.2-2.5 mm (without beak). Surface slight wrinkly or bare, lustreless, brown. 2n = 16.** Native to Europe and western Asia, on fields, pastures, ditches, fallows, on moist up to wet soils; throughout the Carpathians.



**755. *Ranunculus sardous*** Crantz subsp. *subdichotomicus* Gars. — Annual or overwintering, 10-45 cm high, densely hirsute, stems erect, much ramified. **Fruits achenes, obovate-cuneate, widest at about the middle, margin wide, distinct, apex abrupt narrowed to straight or slight curved beak, 2.8-3.2 x 2.2-2.5 mm. Surface smooth or minute punctuate, with small, obtuse tubercles near the margin, lustreless, brown to black-brown. 2n = 16, 18, 48.** Indigenous to Europe, western Asia, northern Africa, in moist to wet, humous, sandy and loamy soils; in the whole Carpathians.

**756. *Ranunculus sceleratus*** L. — Annual or overwintering, 20-80 cm,  $\pm$  glabrous, stems erect, stout hollow, sulcate, much ramified. **Fruits achenes, obovate, flattish, transverse section elliptic, margin list thicken, short subterminal or terminal straight beak on the apex, 1-1.2 x 0.7-0.9 mm. Surface central with a transversal ridged area, glabrous, light orange-yellow or yellow-green. 2n = 32.** Distributed in Europe, Asia, Africa, common in slow streams, boggy places, edges of ponds, ditches; throughout the Carpathians.

**757. *Ranunculus stevenii*** Andr., *R. strigosus* Schur — Perennial, stems 30-80 cm high, inflorescence many-flowered, flowers yellow. **Fruits achenes, obovoid or  $\pm$  roundish, lateral compressed, apex with slight curved beak, 2.8-3.2 x 1.8-2.2 mm. Surface fine colliculate, slight lustrous, black, margin brown.** Native to central Europe, on moist meadows, forest margins, in montane and subalpine zones. Hu, Mo, Pl, Ro, Uk.

**758. *Ranunculus thora*** L., *R. scutatus* Waldst. et Kit., *R. tatrae* Borbás — Perennial, stem erect, brownly scaled on base, usually unbranched, up to 1/2 leafless, glabrous. **Fruits achenes, subglobose, lateral slight compressed, biconvex, narrow hemmed at margin, apex with a recurved beak, 3.8-4.3 x 2.2-2.6 mm. Surface distinct veinous, lustreless, yellowish-green to pinkish. 2n = 16.** Native to montane and subalpine zones of Europe, high mountain ridges, overgrown rocks and screes, on calcareous, humous, stony soils. Pl, Ro, Sk.

**759. *Ranunculus zapalowiczii*** Pacz. — Perennial, stems 15-40 cm high, nearly smooth. **Fruits achenes,  $\pm$  roundish or obovoid, lateral compressed, margin with a semidistinct wing and a small recurved beak, 2.4-2.7 x 2.2-2.4 mm. Surface punctulate,**

**faint lustrous, dark-brown.** Native to the eastern Carpathians, on steppe slopes. Pl, Uk.

**760. *Batrachium aquatile*** (L.) Dumort., *Ranunculus aquatilis* L. — Annual up to perennial, tufted in mud, erect in water, stem in mud about 10 cm, in water 100-150 cm long. **Fruits achenes, obovate-reniform, with distinct 5-12 ribs and a small straight beak on the apex, short bristly, later bald, 1.5-1.8 x 1.1-1.3 mm. Surface glabrous, pale-brown. 2n = 48.** Distributed in Europe, Asia, Africa, North and South America; in stagnant and slowflowing waters of lowlands and uplands. Hu, Pl, Ro, Sk, Uk.

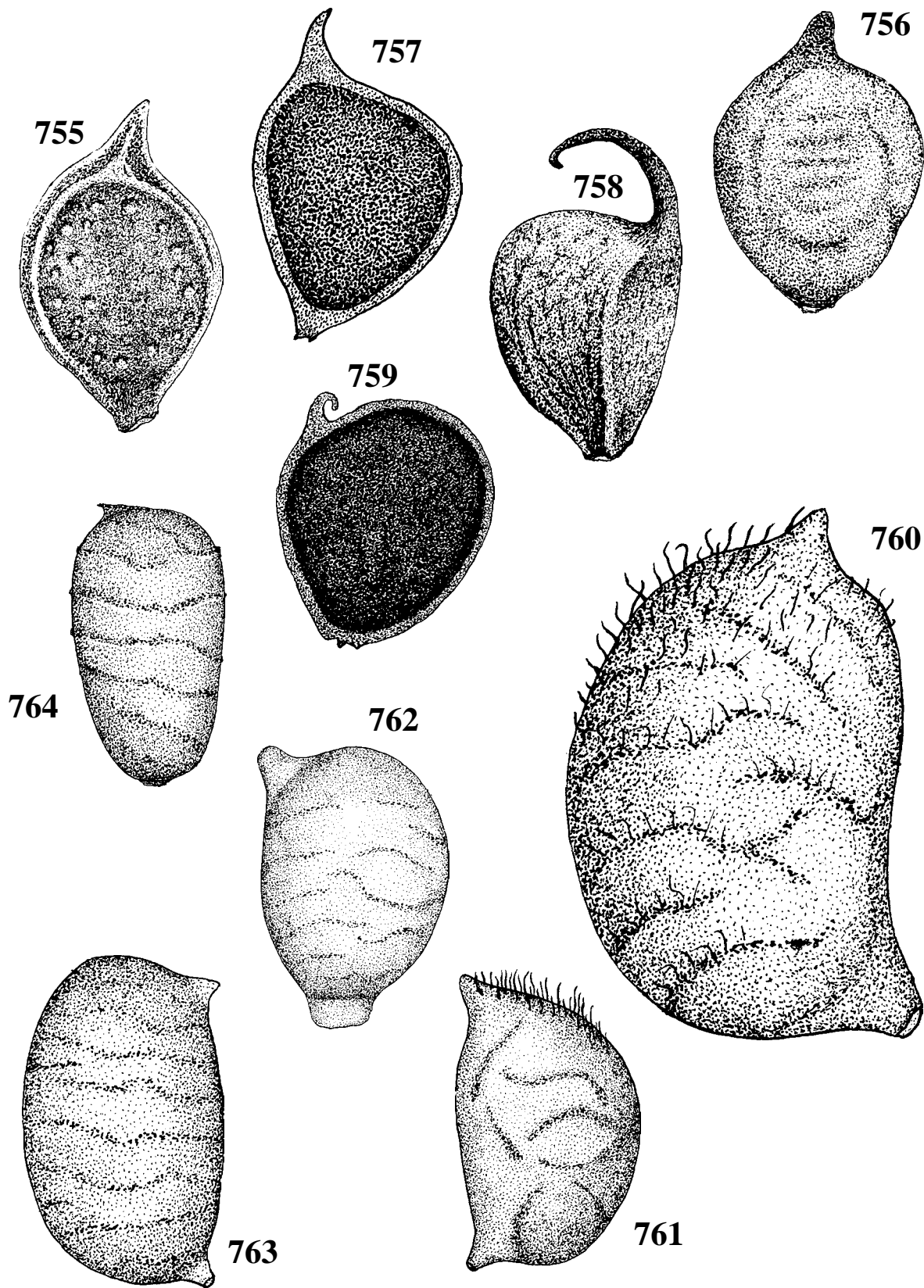
**761. *Batrachium circinatum*** (Sibth.) Spach., *Ranunculus circinatus* (Sibth.), *R. divaricatus* auct. non Schrank — Perennial, seldom annual, stems 1-3 m long, floating in water, ramified, glabrous. **Fruits achenes, reniform-elliptic, transversal ribbed, transverse section rounded, at the apex short bristly, with small beak, rare naked, 1.4-1.6 x 0.8-1.2 mm. Surface glabrous, pale-brown to brown. 2n = 16.** Originally an Eurasian species, in stagnant and slow-flowing waters, eutrophic ponds, water ditches; throughout the Carpathians.

**762. *Batrachium fluitans*** (Lam.) Wimm., *Ranunculus fluitans* Lam. — Perennial, seldom annual, very variable, submerged plants 60-200 cm long, leaves shoestringly divided. **Fruits achenes, ovate-elliptic, transversal ribbed, apex with short and blunt beak, usually naked or sparse bristly, 1.4-2.2 x 1.3-1.8 mm. Surface glabrous, lustreless, pale-brown. 2n = 16, 24, 32.** Local occurrences in western and central Europe, in slow flowing mesotrophic cool waters. Pl, Ro, Sk, Uk.

**763. *Batrachium hederaceum*** (L.) S. F. Gray — Perennial, a procumbent annual or biennial, growing on mud or in shallow water, leaves 1-2 cm wide, reniform or suborbicular-cordate. **Fruits achenes, oval, with a lateral small beak at the apex and a hilum on the lateral side of the bottom, 1.4-1.7 x 0.9-1.1 mm. Surface smooth, transversal rugose, dull, pale-brown. 2n = 16.** Native to western Europe, extending eastwards to Poland. Pl.

**764. *Batrachium rionii*** (Lager) Nyman, *Ranunculus rionii* Lager — Annual, a short-lived gracile water plant, leaves sessile, glabrous. **Fruits achenes, ellipsoidal or obovoid, transversal ribbed, with a**





very small beak at the apex, 1-1.4 x 0.6-0.8 mm. Surface glabrous, green- or pale-brown.  $2n = 16$ . Native to southern Eurasia, in stagnant waters. Mo, Ro, Sk, Uk.

**765. *Batrachium trichophyllum*** (Chaix) Bosche, *Ranunculus trichophyllus* Chaix — Annual to perennial, 30-80 cm long stems, submerged in water, without laminate leaves. **Fruits achenes, obovate-elliptic, transversal ribbed, apex with a small short and blunt beak, dorsal part bristly, ventral naked, 1.6-2 x 1-1.3 mm. Surface lustreless, pale-brown.  $2n = 16, 32$ .** Native to Eurasia, North America, in stagnant and slow-flowing meso- and eutrophic waters; in the whole Carpathians.

**766. *Myosurus minimus*** L. — Annual, up to 2-20 cm high, glabrous, leaves in a basal rosette. **Fruits achenes, elliptic, lateral view biconvex, transversal elliptic, apex with a beak, keeled, 0.6-1.2 x 0.4-0.5 mm. Surface lustrous, indistinct longitudinal striate, light nut-brown to dark-brown.  $2n = 16, 18$ .** Spread throughout the world in moist sandy and loamy soils of fields, exposed bottoms of ponds; in the whole Carpathians.

**767. *Adonis aestivalis*** L., *A. phoeniceus* L. em. Huds. — Annual, 20-60 cm high, stems erect, shortly branched, furrowed above. **Fruits achenes, oblique ovoid, wrinkly-pitted with a transverse ridge, usually crested-dentate around the middle, margin obtuse or acute, apex with a terminal recurved or slight curved beak, 4-4.4 x 3.4-3.8 mm. Surface dull, grey-green or grey-yellow.  $2n = 32$ .** Mediterranean and Euro-Siberian species, weed in cornfields. Hu, Mo, Pl, Ro, Sk, Uk.

**768. *Adonis autumnalis*** L., *A. annua* L. em. Huds., *A. atrorubens* Fritsch — Annual, stems branched, 20-50 cm high, flowers 15-30 mm in diam. **Fruits achenes, ovoid, lateral slight compressed, beak  $\pm$  straight, 4-5 x 2.3-2.9 mm. Surface irregular wrinkly, lustreless, yellowish-green.  $2n = 32$ .** Native to southern Europe; hauling into the Carpathians and sometimes cultivated in gardens or escaping.

**769. *Adonis flammea*** Jacq. — Annual, 15-40 cm high, stems erect, simple or in upper 1/3 longly ramified, regularly sulcate. **Fruits achenes, aslant ovate, apex narrowed to straight or slight curved beak, with a black tip located on one side, 3-4.4 x 1.5-3.2 mm. Surface wrinkly, yellow-brown, yellow-green, brown.  $2n = 32$ .** Southern and central

Europe, on dry slopes, along roads, cereal fields. Hu, Mo, Pl, Ro, Sk, Uk.

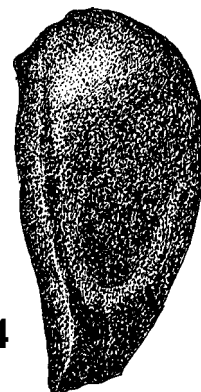
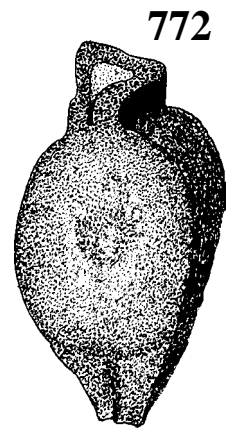
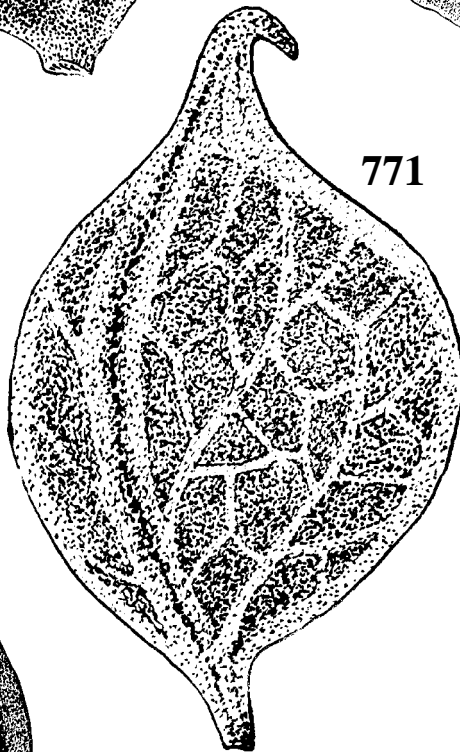
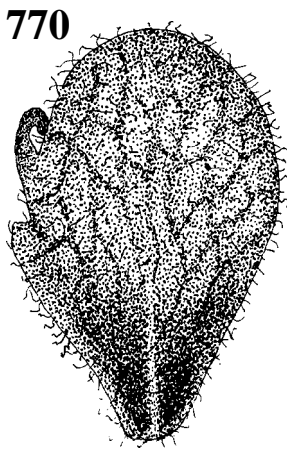
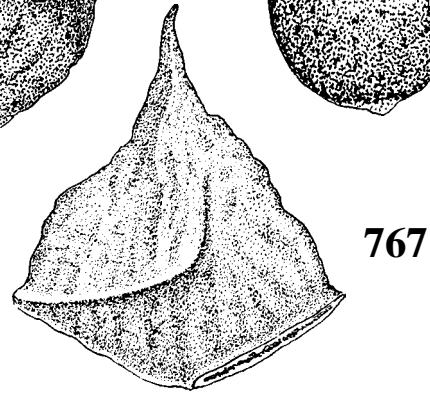
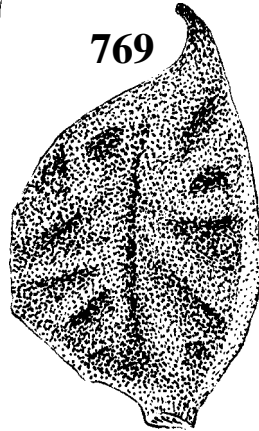
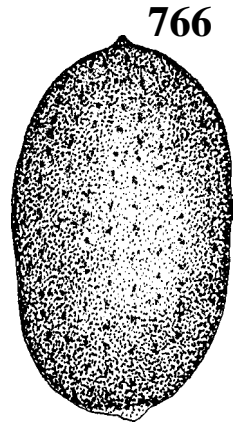
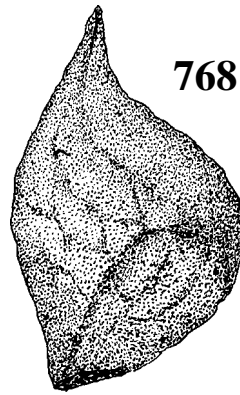
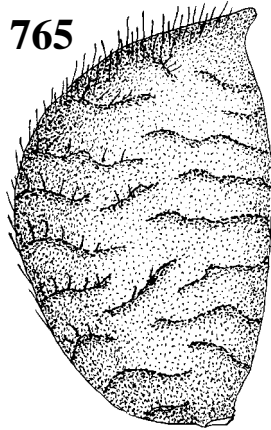
**770. *Adonis vernalis*** L., *A. apennina* Lumn., *Adonanthe vernalis* (L.) Spach — Perennial, up to 10-40 cm high, rhizome rough, black-brown, stem erect, scaly at base, unramified. **Fruits achenes, almost globose, beak short, recurved on lateral site and appressed to achene, 4.5-5.2 x 2.8-3.4 mm. Surface reticulate rugose and rather dense pubescent.  $2n = 16$ .** Native to eastern, central and southern Europe, extending as far as Sweden and the Ural, in open pine woods and sandy, semiarid turfs. Hu, Mo, Pl, Ro, Sk, Uk.

**771. *Callianthemum coriandrifolium*** Rchb., *Ranunculus rutaefolium* auct non L. — Perennial, stems erect, 5-30 cm high, unbranched, glabrous. **Fruits achenes, spherical, with a terminal curved or recurved beak, 3.3-3.7 x 2.2-2.5 mm. Surface irregular reticulate-foveolate, lustreless, yellowish or pale-brown, partly violetish in the upper part.** Native to the Alps, Carpathians and the Balkan Peninsula, in moist rock slits, springheads, on humous, granite, neutral to acid stands, sometimes cultivated in rock-gardens. Pl, Ro, Sk.

**772. *Isopyrum thalictroides*** L. — Perennial, up to 10-30 cm, high, stems simple, slender, erect, ramified above, without leaves below, scaly. **Seeds obovate-circular, compressed, apex with an irregular formed beak, 3.6-4.4 x 2.3-2.7 mm. Surface glabrous, with a socket on one side, scarlet, dark-red.  $2n = 14$ .** Native to central and southern Europe, in leafy, humous woods, shrubberies, shady places, in lowland zone; throughout the Carpathians.

**773. *Aquilegia atrata*** W. D. J. Koch, *A. vulgaris* L. subsp. *atrata* (W. D. J. Koch) Gaudin — Perennial, up to 30-80 cm high, stems erect, ramified. **Seeds obovoid-elliptic, biconvex, margin distinct keeled, 2-2.3 x 1-1.3 mm. Surface glossy, glabrous or fine wrinkly, black.  $2n = 14$ .** Native to the southern Alps; in the Carpathians sometimes cultivated for ornament, calcicole, rarely naturalized.

**774. *Aquilegia chrysantha*** Gray — Perennial, stems 80-100 cm, looks in comprehensive more slender than *A. vulgaris*, with smaller and slimmer leaves, flowers light-yellow, with a slender spur. **Seeds obovoid, mostly winged on one side, rare on both sides, 1.8-2.1 x 0.9-1.1 mm. Surface smooth, glossy, black.** Native to New Mexico; in the Carpathians, rarely



cultivated in gardens as ornamental, frequently in its hybrid forms.

**775. *Aquilegia flabellata*** Siebold et Zucc. — Perennial, stem 20-30 cm high, leaves greyish-green, flowers bluish-white, spur bended. **Seeds obovoid or beet-shaped, transversal section  $\pm$  roundish, winged on one or both sides, 1.7-2.2 x 0.8-1.1 mm. Surface smooth, lustrous, black.** Native to Japan; in the Carpathians seldom cultivated in gardens as ornamental.

**776. *Aquilegia nigricans*** Baumg., *A. vulgaris* L. subsp. *nigricans* (Baumg.) Domin — Perennial, up to 40-80 cm, stems in the upper part and leaves glandular-hirsute. **Seeds obovate-elliptic, margin distinct keeled, transverse section rounded, side faces convex, 2.1-2.5 x 1.2-1.4 mm. Surface lustrous, glabrous, black. 2n = 14.** Native to the East Carpathians and the Balkan Peninsula, on overgrown rocks, shrubby gulls and screes, with calcareous and basis foundations. Ro, Sk, Uk.

**777. *Aquilegia skinneri*** Hook. — Perennial, stems up to 50-60 cm high, with light-green leaves, yellow flowers, with a reddish long spur. **Seeds obovoid, with a narrow wing or without wing on one side, 2.2-2.5 x 1.1-1.3 mm. Surface smooth, sometimes broad grooved, glossy, black.** Native to New Mexico; in the Carpathians, rarely cultivated in gardens as ornamental, often in its hybrid forms.

**778. *Aquilegia transsilvatica*** Schur — Perennial, up to 15-45 cm high, stems subglabrous below, with long glandular hairs above. **Seeds obovoid-elliptic, margin distinct keeled, side faces convex, transverse section rounded, 2-2.5 x 1.2-1.5 mm. Surface glabrous or fine waved, glossy, black.** Native to the East Carpathians, rarely on stony and grassy calcareous grounds, in subalpine and alpine zones, cultivated in gardens as a decorative species. Ro, Uk.

**779. *Aquilegia vulgaris*** L., *A. nigricans* Pax, *A. allepitschii* (Zimmerer) Domin — Perennial, 30-90 cm high, stems erect, ramified, poorly leafy, scattered hirsute above. **Seeds obovate, transversal section rounded, side faces convex, margin sharp keeled, 1.8-2.5 x 1-1.3 mm. Surface glabrous, high glossy, smooth, black. 2n = 14.** Native to Eurasia, in dry woodlands, mountain pastures, forests, an ornamental plant cultivated in many cvs; throughout the Carpathians.

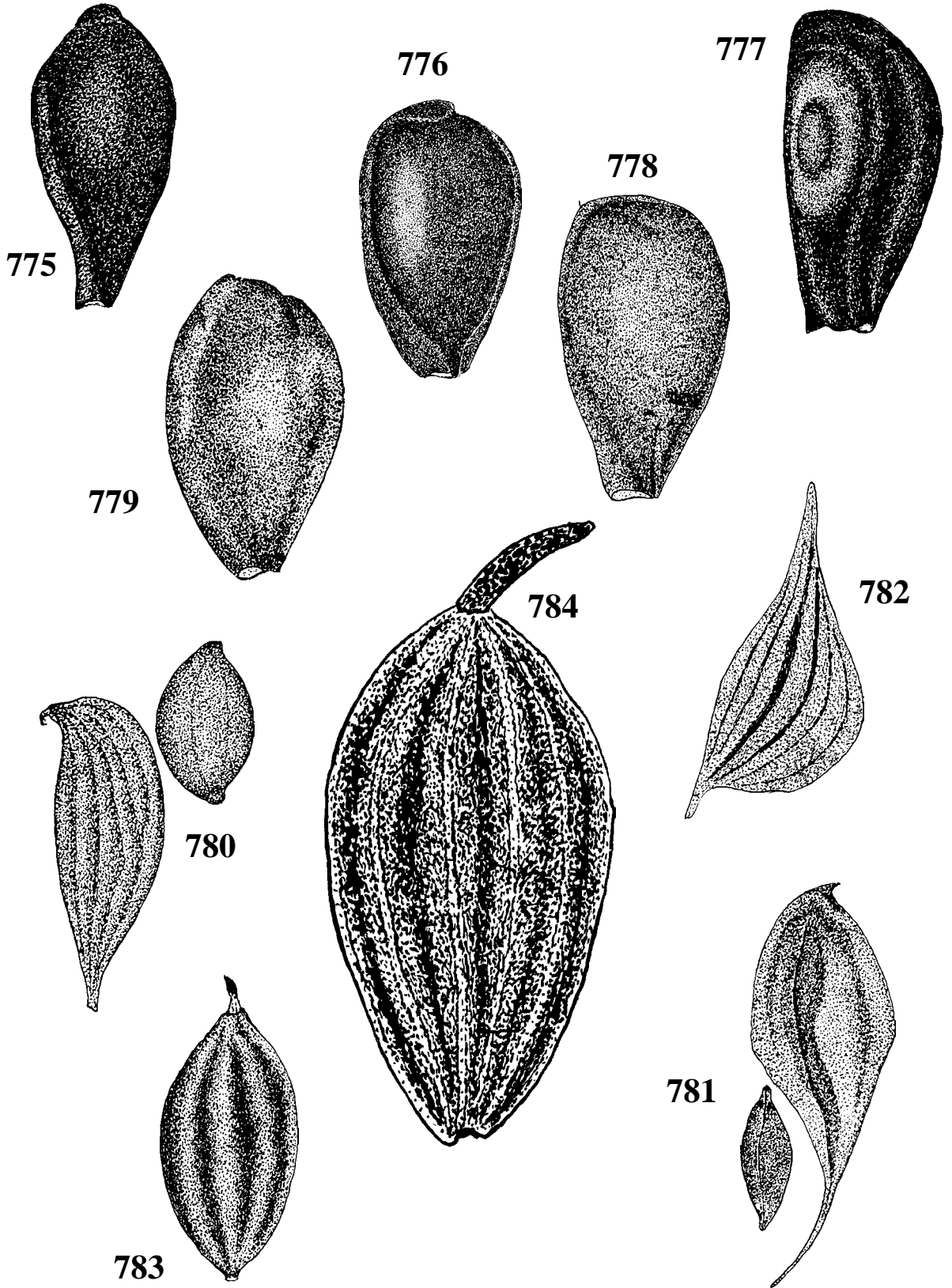
**780. *Thalictrum alpinum*** L. — Perennial, up to 5-50 cm high, stems erect, unbranched, glabrous leaves, present in the bottom part only. **Fruits achenes, subfalcate, narrow oblong, short-stalked, beak short, slight coiled, 3.7-4.2 x 1.4-1.6 mm. Surface ribbed, short-hirsute, dull, greyish-brown. Seeds small with pointed ends. Surface brown. 2n = 14.** Originally growing in arctic and high mountain positions of Eurasia and North America, prevailing on rocky slopes. Ro.

**781. *Thalictrum aquilegifolium*** L. — Perennial, up to 40-150 cm high, stems erect, smooth, glabrous, fine grooved. **Fruits achenes, ovate, transverse section irregular triangular, angles winged, apex rounded, beak short, curved, appressed, base tapering into a stipe about as long as the achenes, 7-11 x 3-4 mm. Surface pale-brown. Seeds fusiform, blunt 3-angular, 3.2-3.7 x 1.3-1.5 mm. Surface waved, lustrous, red-brown. 2n = 14.** Native to central and eastern Europe, locally on mountain woodlands and moorlands; throughout the Carpathians, occasionally cultivated in gardens as an ornamental.

**782. *Thalictrum dipterocarpum*** Franchet — Perennial, stems 120-160 cm high, angular, flowers in slender racemes, fine pinkish. **Fruits achenes,  $\pm$  roundish or half-moon shaped, lateral flattish, with 1 to 6-veinous and indistinct wing at the margin, prolonged into a long beak at the apex, 7-8 x 2.8-3.2 mm. Surface dull, olive-greyish.** Native to China; in the Carpathians rarely cultivated as ornamental on moist stands.

**783. *Thalictrum flavum*** L. — Perennial, 50-120 cm high, stems erect, bare, angular, furrowed,  $\pm$  non-ramified. **Fruits achenes, ellipsoid, with 6-8 ribs, transverse section stellar, gradually narrowed on apex and base short beak present, 3.7-4.5 x 1.5-1.8 mm. Surface glabrous, dull, light yellowish-brown.** Native to Euro-Siberia, on shady places, marshes, moist meadows, shrubberies; all over the Carpathian territory.

**784. *Thalictrum flexuosum*** Bernh. ex Rchb. — Perennial, stems 45-100 cm high, leaves dwindled aim at inflorescence, leaves with ascending veins at the beneath side. **Fruits achenes, broad spindleform, with 8-10 ribs and furrows, with a strong beak on the apex, 3.5-4 x 1.7-2 mm. Surface smooth, lustreless, brown. 2n = 42.** Native to the whole Carpathian region, steppes, dry meadows, stony slopes, forest margins, sporadic. Especially Mo, Pl, Ro, Sk, Uk.



**785. *Thalictrum foetidum* L., *Th. styloideum* L.** — Perennial, 10-40 cm high, stems erect, ramified, straight or crooked on knots, glandular and eglandular hairy. **Fruits achenes, ellipsoid-ovoid in outline, lateral compressed, with 2-3 ribs on each side, apex with a curved beak, 3.6-4.5 x 1.8-2.2 mm.** Surface lustreless, fine glandular, pale to dark-brown. Seeds ellipsoid-ovoid, with black hilum and longitudinal furrow on ventral side, 2.2-2.6 x 0.9-1 mm. **2n = 14.** Native to Eurasia, in rocky, chalky, basic, flat soils. Hu, Pl, Ro, Sk, Uk.

**786. *Thalictrum lucidum* L., *Th. angustifolium* Jacq.** — Perennial, up to 60-120 cm high, caespitose, stems erect, angular, grooved, unbranched. **Fruits achenes, oblong-ovoid, with 8-10 strong ribs, transverse section stellar, both ends narrowed, apex with a short beak, 2.3-2.7 x 1.2-1.4 mm.** Surface lustreless, pale orange-yellow. Seeds ovoid, with black hilum and longitudinal furrow on ventral side, 1.6-1.8 x 0.9-1.1 mm. **2n = 28.** Native to central and eastern Europe, in ditches, marshy places, moist to waterlogged meadows, up to 1400 m. Hu, Mo, Pl, Ro, Sk, Uk.

**787. *Thalictrum minus* L.** — Perennial, up to 15-120 cm high, stems erect, ramified, grooved, glabrous in the upper 1/2. **Fruits achenes, broad ovoid to narrow oblong-ovoid, with 8-10 not very strong ribs, transverse section stellar, gradually narrowed on both ends, apex with a small beak, 2.8-3.4 x 0.9-1.3 mm.** Surface lustreless, fine verrucose, pale- to dark-brown. Seeds ovoid, 2.2-2.4 x 1-1.1 mm. **2n = 28, 42.** Native to Eurasia, in steppe, meadows, light woods, shrubby slopes; in the whole Carpathians, occasionally cultivated in gardens as an ornamental.

**788. *Thalictrum petaloideum* L.** — Perennial, up to 15-50 cm high, subtle, stems erect, unbranched. **Fruits achenes, ellipsoid, with 8-10 ribs, transverse section stellar, apex gradually narrowed, acuminate, base rotund, 4-4.5 x 1.7-2 mm.** Surface lustreless, pale- to dark-brown. Native to Eurasia, in rocky steppes, rare. Ro, Uk.

**789. *Thalictrum simplex* L., *Th. angustifolium* auct. non L.** — Perennial, 30-120 cm high, glabrous, stems erect, simple, straight, grooved. **Fruits achenes, ovate-ellipsoid, with 6-10 ribs, transverse section stellar, apex with a small beak, 2.8-3.2 x 1.6-1.9 mm.** Surface dull, verrucose, reddish to dark-brown. **2n = 56.** Seeds ellipsoid, 1.9-2.2 x

**1-1.1 mm.** Most of continental Europe, to a lesser extent in the west, in moist meadows and pastures, rocky, shrubby steppes; throughout the Carpathians.

**790. *Thalictrum uncinatum* Rehm., *T. petaloideum* auct. non L.** — Perennial, stems 15-40 cm high. **Fruits achenes, ellipsoid, with 8-10 ribs, apex with coiled beak, 4.7-5.5 x 2.4-2.8 mm.** Surface deep grooved to winged, smooth, lustreless, greenish or pale-brown. Native to eastern Europe, on calcareous grounds, rare in forest steppes. Uk.

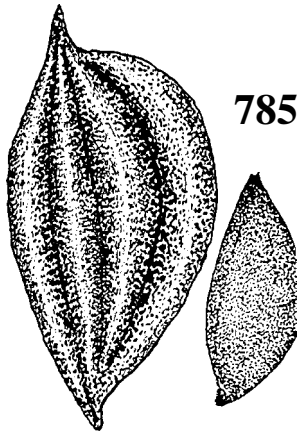
### 39. *NYMPHAEACEAE*

**791. *Nymphaea alba* L., *Castalia alba* (L.) Wood** — Perennial, a water plant, rooted in the mud, with a few stout branches, submerged leaves are rolled up, leathery and glossy. Flowers white. **Seeds ellipsoid, transverse section rounded, with a slight distinct rib, 2.4-3 x 1.5-1.8 mm.** Surface smooth, barely lustrous, brownish-green. **2n = 84, 112.** Native to Europe, Asia and north Africa, in stagnant, slow-flowing waters, pools, dead arms, with muddy bottoms. Br, Hu, Mo, Pl, Ro, Sk, Uk.

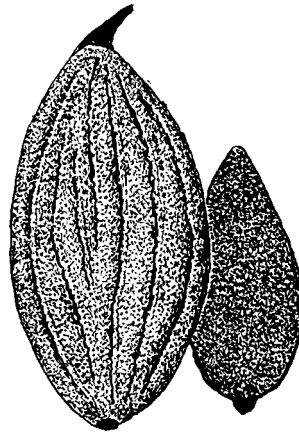
**792. *Nymphaea candida* C. Presl, *Castalia candida* (C. Presl) Schinz et Thell.** — Perennial, similar to *N. alba*, but usually smaller in dimensions. **Seeds ellipsoid or ovate, narrowed at the bottom, with a faint rib, transverse section rounded, 4-4.3 x 2.2-2.4 mm.** Surface smooth, pale-brown or grey-green. **2n = 112, 160.** An Euro-Siberian species, growing under quite the same conditions as *N. alba*. Br, Pl, Ro, Sk, Uk.

**793. *Nymphaea lotus* L. var. *thermalis* (DC.) Tuzs.** — Perennial, a water plant, rhizome stout, horizontal, with slender stolon-like branches, from the ends of which new plants develop. **Seeds ellipsoid, with 8-14 whitish ribs, transverse section rounded, apex with a small beak, base rounded with ascending hilum, 1.5-1.8 x 1.1-1.3 mm.** Surface glabrous, faint lustrous, grey or brownish-grey. Relict of the Tertiary period, growing in warmer conditions (c. 20–40 °C). Spontaneous in northern Africa, India, Oceania; planted as peculiarity of the hot springs and thermal spas.

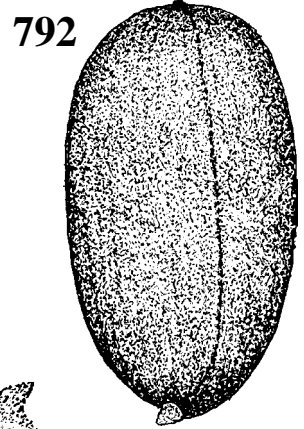
**794. *Nuphar lutea* (L.) Sm., *Nymphaea lutea* L.** — Perennial, a water-plant with rhizome, leaves submerged and floating, flowers yellow. **Seeds obovate, transverse section circular or so, blunt keeled, side faces slanted towards the keel, 5.5-6 x 3.4-3.8 mm.** Surface smooth, glossy, vitreous,



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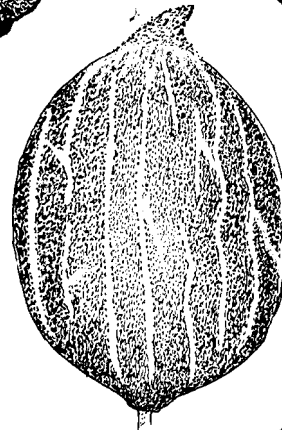
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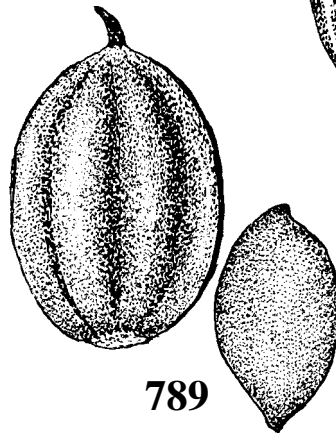
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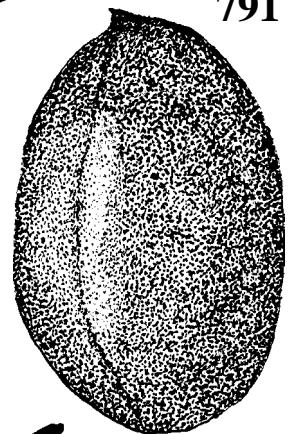
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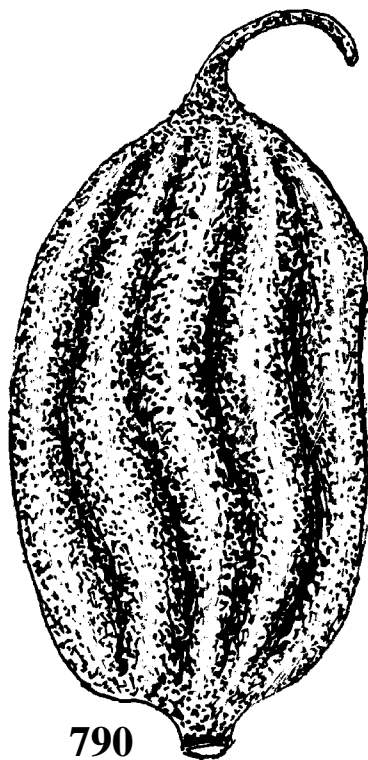
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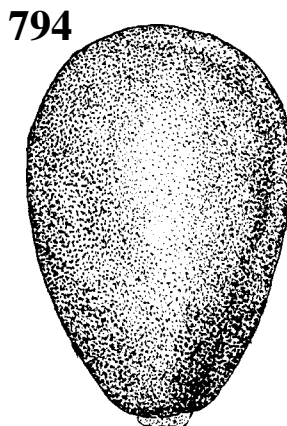
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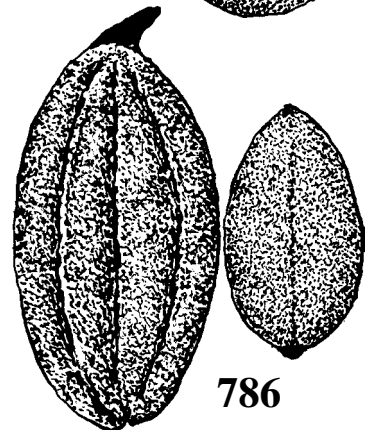
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medium-yellow or pale-brown.  $2n = 34$ . Euro-Siberian floating plant communities, in still or slow-running water; throughout the Carpathians.

**795. *Nuphar pumila*** (Timm.) DC., *N. minimum* Sm. — Perennial, similar to *N. lutea*, but smaller and gentler in dimensions. **Seeds obovate, transparent section rounded, without keel, only an indistinct groove, 3.5-4 x 2.2-2.6 mm. Surface lustrous, smooth, light yellowish-olive.  $2n = 34$ .** Native to Eurasia, a floating plant of still cool waters, relatively poor in nutrients. Br, Pl, Ro.

**796. *Victoria regia*** Lindl. — Perennial, immense, tracy-like, floating plant, leaves circular, peltate, 100-200 cm in diam., with a raised margin, flowers large, pink or cream, strongly scented. **Seeds near spherical, with the rest of the perianth below, 8.5-9.5 x 8-9 mm. Surface glabrous, lustrous, greenish-olive.** Native to tropical South America, grows in warm water. In the Carpathians planted as a peculiarity in thermal spas, greenhouses of botanical gardens.

#### 40. NELUMBONACEAE

**797. *Nelumbo nucifera*** Gaertn. — Perennial, a water plant, with numerous scale-like leaves, flowers borne above the water surface. **Seeds prolonged ovoid, transverse section rounded, apex gradually narrowed, 1.5-2 x 0.9-1.2 mm. Surface slight distinct-ribbed, glabrous, dull, dark-grey.** Native to southern Asia, in still and slow-running waters, pools, dead areas. Ro, Uk.

#### 41. CERATOPHYLLACEAE

**798. *Ceratophyllum demersum*** L., *C. asperum* Lam. — Perennial, up to 50-150 cm long, stems ramified, demerged on water ground. **Fruits achenes, prolonged cylindrical or ovoid with 2 basal spines, straight or curved, 0.1-12 mm long, spine bases occasionally inconspicuously webbed, marginal spines absent, terminal spine straight, 0.5-14 mm long, margins wingless, 3.6-4.4 x 2.6-3 mm (excluding spines). Surface rough or somewhat warty, lustreless, brownish- or reddish brown to dark-olive or dark green.  $2n = 24$ .** Native to Euro-Siberia, in lakes, streams and ponds, in still or slow-running waters; throughout the Carpathian territory.

**799. *Ceratophyllum submersum*** L., *C. granulosum* Schur — Perennial, up to 30-100 cm long, stems branched, slender, straight, submerged in water.

**Fruits achenes, elliptic or globose, basal and marginal spines absent, terminals spine short, often curved, 5-6 x 2.8-3.2 mm. Surface tuberculate, dull, lustreless, brownish- to dark-olive.  $2n = 24, 40, 72$ .** Native to Eurasia, in lakes, slow-running water, channels, ponds, in lowlands and uplands; throughout the Carpathians.

#### 42. ARISTOLOCHIACEAE

**800. *Asarum europaeum*** L. — Perennial, up to 2-10 cm high, stems procumbent, ascendent, scaled, forkedly ramified, pubescent. **Seeds obovate, apex with a slight elevation, slight compressed, transverse section semicircular, dorsal side convex, ventral concave, margin unfolded, 3.6-4.4 x 2.1-2.4 mm. Surface ribbed, buff-olive.  $2n = 26$ .** Originally growing in Eurasia, in shady and moist woods, shrubberies, on humous stands; in the whole Carpathians.

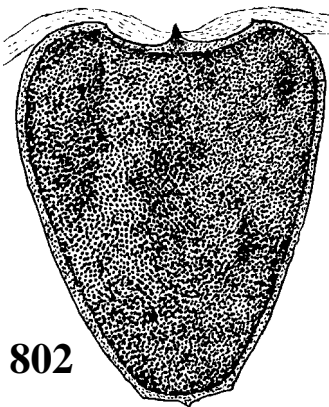
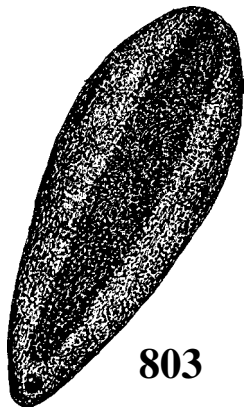
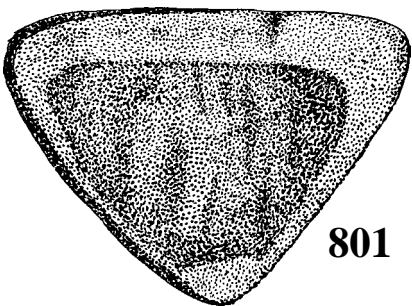
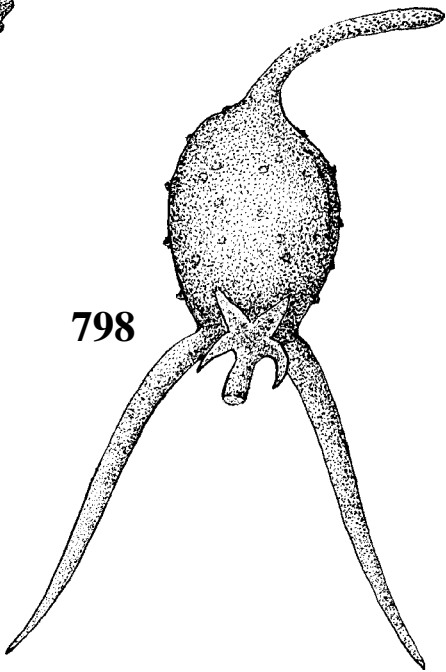
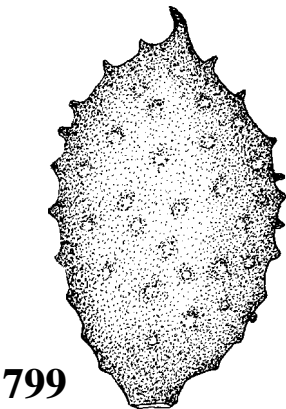
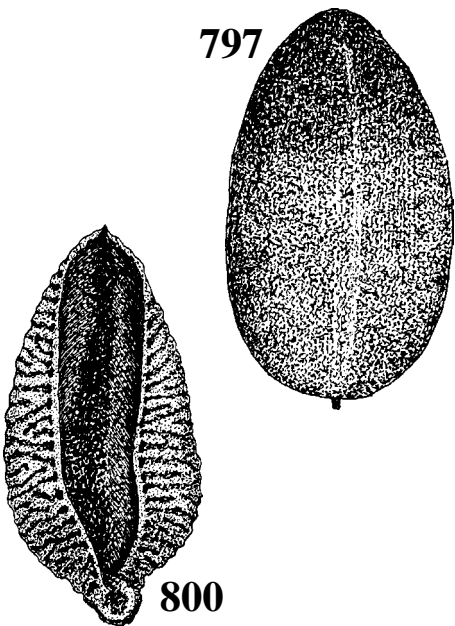
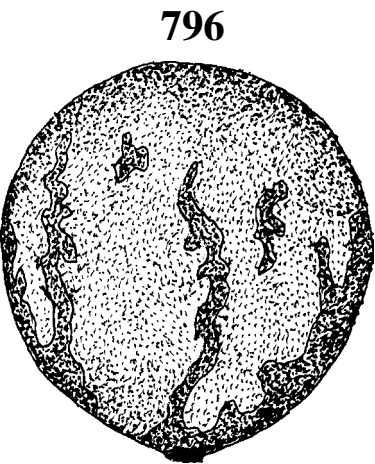
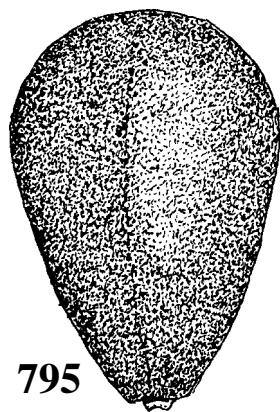
**801. *Aristolochia clematitis*** L. — Perennial, stock creeping, much branched, flattish, up to 100 cm high, glabrous, leafy. **Seeds triangular, flattish, small, with rounded germ navel at base, testa at the apex thicker, 8-11 x 10-15 mm. Surface chestnut-brown, dull.  $2n = 14$ .** Native to Europe, in shady moist woods, shrubberies, river valleys, weed of gardens, orchards, vineyards, on roadsides verges; in the past cultivated as a medicinal herb; widely naturalized in the whole Carpathians.

**802. *Aristolochia durior*** Hill, *A. macrophylla* Lam., *A. siphon* (L.) L'Hér. — Perennial, woody climber, left-winding, 3-8 m long, ramified, with up to 30 cm large leaves. **Seeds cordate, flattish margin with a distinct hem, 7-10 x 6.5-8.5 mm. Surface of the faces glabrous, dorsal side tuberculate, ventral smooth, dark-brown.  $2n = 28$ .** Native to North America; often cultivated in gardens as a covering liana, sometimes naturalized. Hu, Mo, Ro, Sk.

#### 43. BERBERIDACEAE

**803. *Berberis julianae*** C. K. Schneid. — Shrub, up to 2 m high, branches faintly angular, when young yellowish-brown. **Seeds prolonged obovoid, dorsal side convex, ventral flat or mostly concave, with a hilum in the bottom part, 5.9-6.5 x 2.4-2.6 mm. Surface faint waved, glabrous, lustrous, chocolate-brown.** Native to central China; in the Carpathians seldom cultivated in town-verdure and parks as an ornamental.





**804. *Berberis koreana*** Palib. — Shrub, up to 2 m high, branches sulcate. **Seeds obovoid, dorsal side convex, ventral faint concave, apex rounded, bottom narrowed, with a round, flat hilum, 4.7-5.3 x 2.6-2.9 mm. Surface dense foveolate, lustrous, chocolate-brown.** Native to Korea; in the Carpathians rarely cultivated in town-verdure and parks.

**805. *Berberis orientalis*** Schneid. — Shrub, 1.5-2.5 m high, thorns straight, young twigs brightly yellow, yellowish brown later on. **Seeds prolonged obovoid, dorsal side convex, ventral slight concave, 4.5-4.9 x 1.5-1.7 mm. Surface longitudinal fine and short furrowed, slight lustrous, pale- or reddish-brown.** Native to the Crimea; in the Carpathians rarely cultivated as ornamental and for food. Uk.

**806. *Berberis thunbergii*** DC. — Perennial, up to 2.5 m high, young branchlets bare, very abundantly ramified. **Seeds obovate, ellipsoid, dorsal side convex, ventral concave, 4.5-5 x 2.6-2.8 mm.** Native to Japan; very popular in gardening, cultivated in various cvs in park and town verdure, throughout Europe.

**807. *Berberis verruculosa*** Hemsl. et Wils. — Shrub, up to 1.5 m high, dense twigs verrucose, with glossy dark-green leaves and large yellow flowers. **Seeds prolonged ellipsoid, dorsal side convex, ventral planoconvex with a hilum below, 4.7-5.3 x 2.2-2.6 mm. Surface waved, lustrous, dark-brown.** Native to western China; in the Carpathians very rarely cultivated in parks and botanical gardens.

**808. *Berberis vulgaris*** L. — Perennial, up to 1-3 m high, bark smooth, branches mostly erect, ridged, with 3-5 horned thorns. **Seeds prolonged obovate, elliptic, dorsal side convex, ventral slight concave, 4.6-5.2 x 2.2-3 mm. Surface lustreless, rough, with irregular, coarse ridges to almost smooth, red- to dark-brown. 2n = 28.** Most part of continental Europe, on sunny, shrubby slopes, woody borders in warmer areas, cultivated in parks, urban and dwelling verdure, in various cvs; throughout the Carpathians.

**809. *Berberis wilsonae*** Hemsl. et Wils. — Shrub, with deciduous or persistent leaves, young branchlets hirsute. **Seeds prolonged obovoid, slight compressed, apex roundish, bottom gradually narrowed with rounded concave hilum, 3.8-4.2 x 1.6-1.8 mm. Surface fine granulate, faint lustrous, olive to chocolate-brown.** Native to China; in the

Carpathians rarely cultivated in parks and town verdure.

**810. *Mahonia aquifolium*** (Pursh) Nutt., *Berberis aquifolium* Pursh — Shrub, up to 1-2 m high, stoloniferous, stems stout, sparingly branched, without thorns, leaflets ovate with a spiny margin. **Seeds ovate or prolonged ovate, dorsal side convex, ventral double-sided, flat, 4.7-5.2 x 1.8-2.2 mm. Surface smooth, fine verrucose, lustrous, dark-red. 2n = 28.** Native to North America; very often cultivated in gardens, parks, town-verdure as an ornamental, locally naturalized in the whole Carpathians.

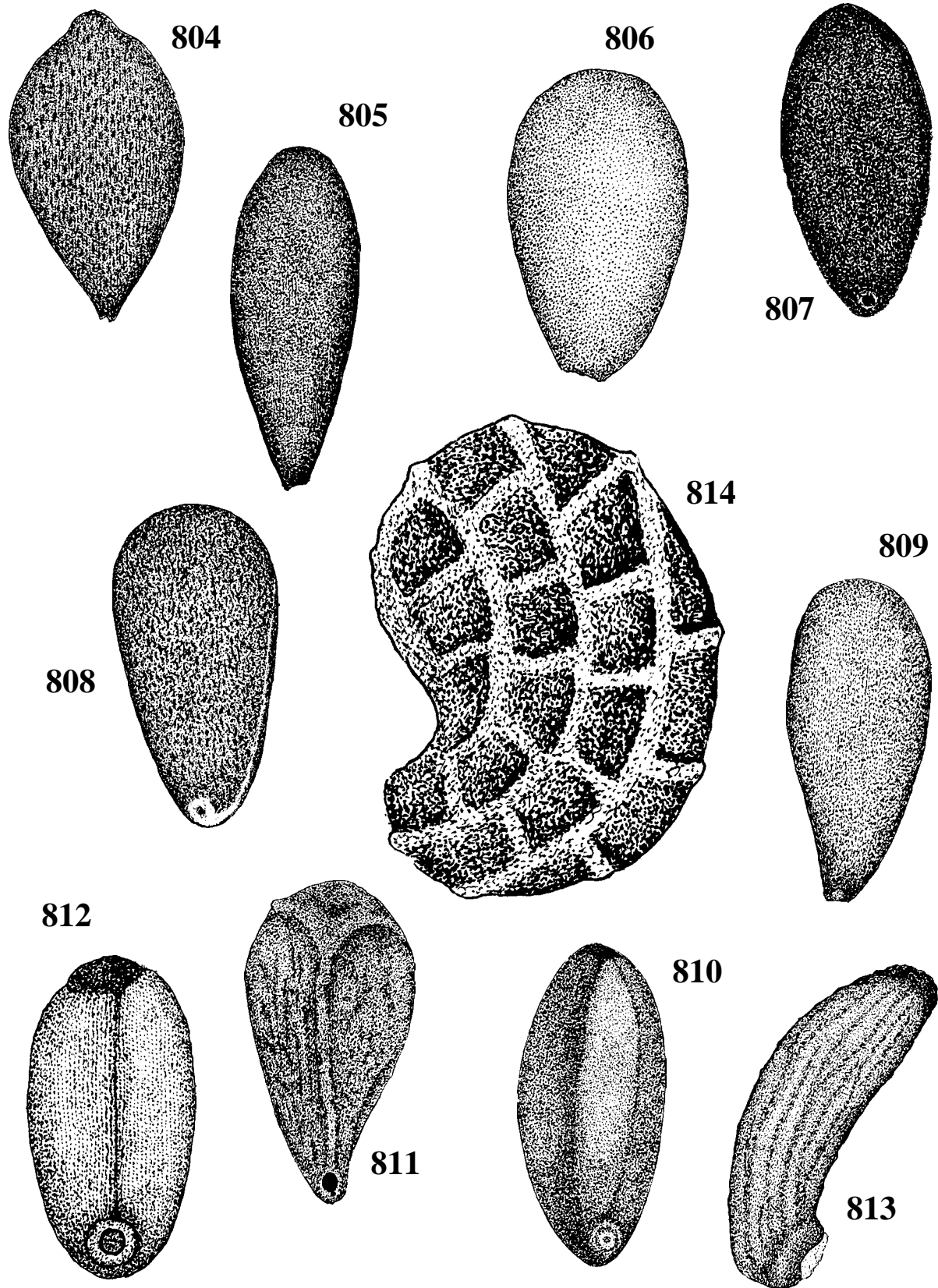
**811. *Mahonia bealei*** (Fort.) Carr. — Shrub, up to 4 m high, stems slender, with thick, upright twigs. **Seeds obovoid, strong compressed, apex with darker head, bottom narrowed, 6-7 x 3.2-3.8 mm. Surface wrinkly and faint colliculate, lustrous, reddish-brown.** Native to China; in the Carpathians rarely cultivated in parks and town verdure.

**812. *Mahonia repens*** (Lindl.) G. Don — Low shrub, 10-20 cm high, creeping, excurrent, unarmed twigs arising from underground sprouts, leaves dull, green, pinnate, evergreen. **Seeds ellipsoid, dorsal side convex, ventral planoconvex, with or without a longitudinal furrow, apex rounded, bottom narrowed with hilum, 3.8-4.5 x 2.1-2.5 mm. Surface glabrous, glossy, purple.** Native to North America, very rarely cultivated in parks, locally naturalized. Sk.

**813. *Epimedium alpinum*** L. — Perennial, up to 15-30 cm high, one-leaf stems numerous, arising from a slender, creeping rhizome. **Seeds prolonged elliptic, reniform, apex rounded, hilum on ventral side rounded, 3.9-4.3 x 1.3-1.5 mm. Surface deep furrowed, lustrous, smooth, scarlet. 2n = 12.** Originally spread from southeastern Europe on foothills and lower slopes of mountains; in the Carpathians often cultivated in gardens as an ornamental permanent plant, locally naturalized.

#### 44. PAPAVERACEAE

**814. *Papaver albiflorum*** (Bess.) Pacz., *P. dubium* subsp. *albiflorum* (Dostál) non Elkan. — Annual, 20-60 cm high, stems ± unramified, bristly woolly. **Seeds reniform, dorsal side convex, ventral concave, 0.5-0.6 x 0.6-0.9 mm. Surface lustreless, reticulate, greyish-brown. 2n = 28.** Native to southeastern Europe, in calciferous steppes, fields, gardens, roadsides, lawns, in sunny stony soils. Ro, Sk, Uk.



**815. *Papaver argemone* L.** — Annual or biennial, up to 10-70 cm high, stems erect or ascending, simple or ramified, leafy, bristly hirsute. **Seeds narrow reniform, transverse section elliptic or circular, dorsal margin convex, ventral concave, 0.5-0.6 x 0.9-1.1 mm. Surface distinct, reticulum arranged in rows, olive-brown, reticulum ribs pale. 2n = 42.** Native to southern Europe and widespread as a weed of cultivated fields, fallows, vineyards, waste grounds, on sandy and stony grounds; throughout the Carpathians.

**816. *Papaver bracteatum* Lindl.** — Perennial, stems up to 1 m high, flowers bloody red, bottom of the flower petals with black spots. **Seeds reniform, dorsal side convex, ventral concave with hilum, 0.7-0.9 x 1.1-1.3 mm. Surface with ascending reticulum, ribs obtuse, slight lustrous, dark-brown. 2n = 14-42.** Native in the Front India and the Caucasus; in the Carpathians cultivated in gardens as permanent ornamental plant, inability naturalized.

**817. *Papaver confine* Jord., *P. dubium* subsp. *turbinatum* auct. non (DC.) Dostál** — Annual, stems erect, 20-60 cm high, simple, latex yellowish. **Seeds reniform, dorsal side convex, ventral faint concave, 0.7-0.8 x 0.55-0.65 mm. Surface coarse reticulate, brownish-grey. 2n = 42.** Native to central Europe (Slovakia), in warmer lowland areas.

**818. *Papaver corona-sancti-stephani* Zapal., *P. pyrenaicum* (L.) A. Kern, *Argemone pyrenaica* L.** — Perennial, stems numerous, caespitose, erect, 5-20 cm, basal leaves in a rosette, hirsute, 2-7 cm long. **Seeds reniform, longitudinal slight compressed, 0.6-0.8 x 0.5-0.6 mm. Surface shallow reticulate, faint lustrous, dark-brown.** Native endemic to Romania, on calcareous rocky stands, in alpine and subalpine zones. Ro.

**819. *Papaver croceum* Ledek., *P. nudicaule* auct. non L.** — Perennial, caespitose sparsely pubescent, stems 20-50 cm high, erect, robust, flowers up to 6 cm in diam. **Seeds reniform, dorsal side convex, ventral concave, 0.5-0.6 x 0.8-1 mm. Surface scalariform with an ascending reticulum, slight lustrous, dark-brown. 2n = 14.** Native to eastern Asia; in the Carpathians cultivated in rock-gardens, especially the forms with flowers of various colours, uniquely naturalized.

**820. *Papaver dubium* L., *P. obtusifolium* Desf., *P. modestum* Jord.** — Annual, 30-60 cm high, stems erect

± simple or branched, latex white, hispid. **Seeds reniform, transverse section elliptic to circular, dorsal side slight convex, ventral narrowly concave, 0.5-0.6 x 0.7-0.9 mm. Surface dull, reticulate with a six-angled reticulum, ribs paler, blackish-blue. 2n = 42.** Native to the Mediterranean, spread in central Europe, on waste grounds, as a weed in fields, predominantly in cereals, up to 1000 m elevation; in the whole Carpathians.

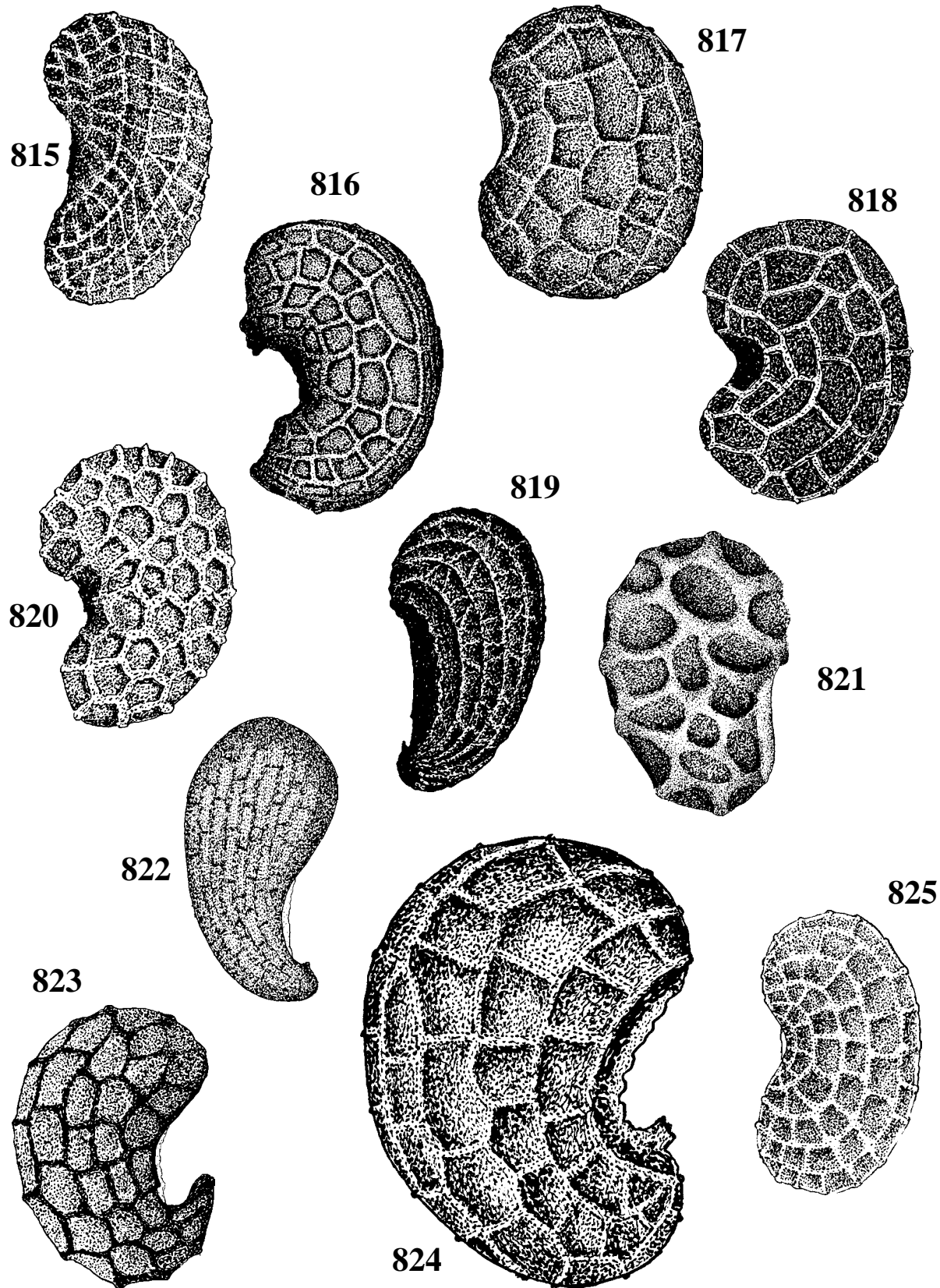
**821. *Papaver hybridum* L., *P. hispidum* Lam.** — Annual, 20-60 cm, stems erect or ascending, ± unramified, leafy, bristly hirsute. **Seeds obovate-reniform, hilum asymmetric, oval, concave, 0.5-0.7 x 0.8-1 mm. Surface reticulate, tief pitted, the pits irregular shaped, lustreless, blackish-blue, ribs paler. 2n = 14.** Native to southern Europe, on dry slopes, widespread, as a weed of tilled fields. Hu, Mo, Ro, Sk, Uk.

**822. *Papaver nudicaule* L.** — Perennial, up to 30 cm high, flowering stems up to 50 cm, yellow flower up to 5 cm in diam. **Seeds prolonged obovoid, apex broad and roundish, bottom gradually narrowed, crooked, 1-1.2 x 0.55-0.65 mm. Surface reticulate, longitudinal layered, faint lustrous, dark-brown.** Originally growing in arctic and subarctic Eurasia, in alpine mountains and tundras; in the Carpathians often cultivated in rock-gardens for ornament.

**823. *Papaver orientale* L.** — Perennial, up to 40-80 cm high, stems bristly hirsute. **Seeds reniform or almost falcate, broader at the apex than at the bottom, 0.7-0.8 x 1-1.3 mm. Surface reticulate, shallow pitted with a darker reticulum, lustreless, reddish-brown. 2n = 28.** Originally spread from Asia Minor, the Caucasus; in the Carpathians cultivated in gardens and parks as an ornamental in various cvs, occasionally naturalized.

**824. *Papaver pseudo-orientale* (Fedde) Medw., *P. lasiothrix*** — Perennial, up to 40-120 cm high, rough bristly hirsute. **Seeds reniform, with areolate reticulum, side faces convex, 0.8-1 x 1.2-1.4 mm. Surface reticulate, lustreless, dark-brown. 2n = 42.** Probably of hybrid origin (*P. orientale* x *bracteatum*), often cultivated in gardens as an ornamental or as a medicinal plant, sometimes naturalized.

**825. *Papaver rhoeas* L.** — Annual or biennial, up to 25-90 cm high, stems erect, ± poorly-ramified, bristly hirsute, leafy. **Seeds broad reniform, dorsal side high convex, ventral deep concave,**



**0.5-0.7 x 0.8-1 mm. Surface lustreless, scalariform-reticulate, on side faces arranged in concentric rows, mostly square-shaped, red-brown, ribs greyish.  $2n = 14$ .** Throughout the most part of temperate Eurasia; as a weed of tilled fields and waste places.

**826. *Papaver setigerum* DC., *P. somniferum* L. subsp. *setigerum* (DC.) Corb.** — Annual, plant patent bristly hirsute, stems up to 60 cm high, erect. **Seeds reniform, dorsal side convex, ventral deep concave, 0.6-0.7 x c. 0.9 mm. Surface irregular whitish reticulate, lustreless, pale- or dark-grey.  $2n = 44$ .** Native to the western Mediterranean, a weed of fields and fallows, on disturbed grounds; rarely hauling into the Carpathians.

**827. *Papaver somniferum* L.** — Annual, up to 30-150 cm high, stems simple, erect, ramified, leafy, glaucous. **Seeds broad reniform, transverse section elliptic to circular, dorsal side convex, ventral concave, hilum hyaline, 0.9-1.1 x 1.3-1.5 mm. Surface lustreless, side faces coarse areolate-reticulate, pale grey, chalaza slight darker.  $2n = 22$ .** A very old cultivated plant of unknown origin; grown for medicinal, culinar and narcotic purposes; in the whole Carpathians.

**828. *Papaver stevenianum* Mikheev, *P. dubium* subsp. *stevenianum* (Mikheev) Kubát et Šípošová** — Annual, stems erect or ascending, 10-75 cm, simple or branched above, bristly-hirsute. **Seeds reniform, lateral compressed, 0.7-0.9 x 0.5-0.6 mm. Surface reticulate, lustreless, dark-blue to black.  $2n = 42$ .** Native to the North Caucasus, hauling and transiently naturalized in central Europe, on ruderal stands. Sk.

**829. *Papaver strigosum* (Bönn.) Schur, *P. rhoeas* L. subsp. *strigosum* (Bönn.) Simk.** — Annual, 30-70 cm high, stems above and flower stalks adpressed bristle-hirsute, loculi  $\pm$  narrowed at bases. **Seeds reniform, lateral slight compressed, 0.9-1 x 0.6-0.7 mm. Surface reticulate, faint lustrous, dark-grey.** Native to the Euro-Mediterranean, as weed in cereal fields, along roads, stony stands, rubbish heaps, in warmer regions, Hu, Pl, Ro, Sk, Uk.

**830. *Papaver tatricum* (A. Nyár.) Ehrend., *P. burseri* auct. non Crantz, *P. alpinum* subsp. *burseri* (Crantz) Fedde** — Perennial, small mountain plants, flowering stems 15-20 cm high, bare, ground leaves in a rosette. **Seeds subreniform, upper part broader than the bottom, 0.9-1.1 x 0.5-0.6 mm. Surface prolonged**

**scalariform-reticulate, lustrous, reddish- to dark-brown.  $2n = 14$ .** A Carpathian endemic, on calcareous or granite tiny screes. Pl, Sk.

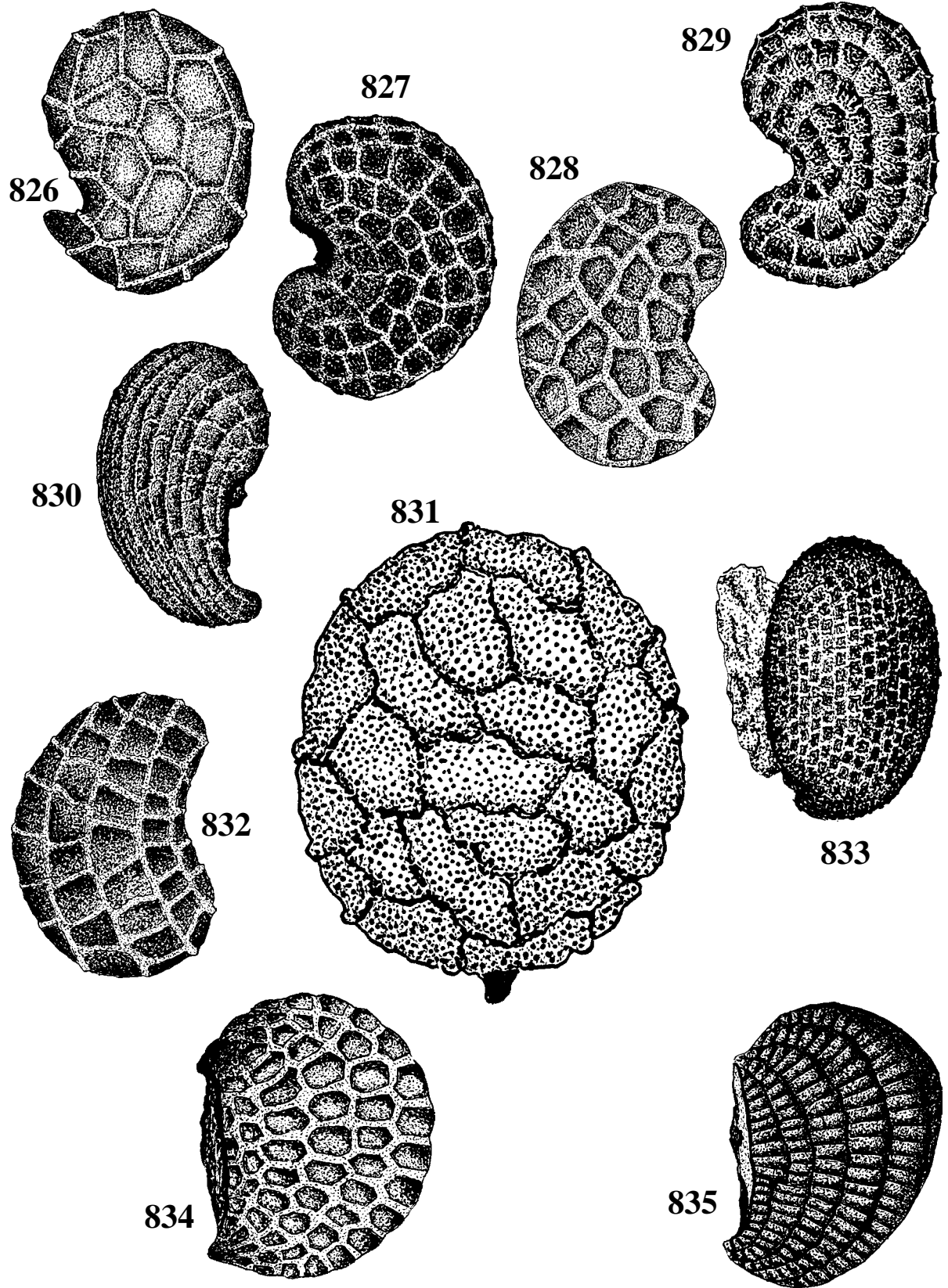
**831. *Eschscholzia californica* Cham.** — Annual or perennial, 20-60 cm high, glabrous, stems erect or spreading, leafy, bluish-green. **Seeds circular or slight ellipsoid, 1.6-2 x 1.5-1.7 mm. Surface of the whole face coarse areolate-reticulate, lustreless, minute granulate, greyish-brown to black.  $2n = 12$ .** Originally growing in North America; in the Carpathians widely planted in gardens and parks as an ornamental summer plant, casually naturalized.

**832. *Roemeria hybrida* (L.) DC.** — Annual, a plant with dense, yellow, milky juice, stems 10-50 cm, loculi 3-10 cm long, cylindrical, hirsute. **Seeds reniform, lateral slight compressed, 0.8-1 x 1.2-1.5 mm. Surface reticulate-foveate, lustreless, grey.** Native to the Crimea, on dry stony slopes; in the Carpathians sporadically cultivated as a decorative summer plant. Uk.

**833. *Chelidonium majus* L.** — Perennial, up to 30-100 cm high, stems erect, ramified, oval, sparsely pubescent. **Seeds subreniform or ellipsoid, transverse section circular, dorsal side convex, ventral straight, hilum with a fleshy, crested white later yellowish aril, 1.9-2.1 x 1.1-1.2 mm. Surface glabrous, lustrous, areolate-reticulate, brown to dark-brown.  $2n = 12$ .** Native to Eurasia, on waste grounds, shrubberies, coastal thickets, lowland woods, dwelling places; throughout the Carpathians.

**834. *Glaucium corniculatum* (L.) Rudolph, *G. phoeniceum* Crantz** — Annual or biennial, bristly hirsute, stems 30-40 cm high, poorly ramified. **Seeds unilateral semicircular to reniform, lateral view slight compressed, dorsal side convex, ventral straight, 1.5-1.8 x 1.2-1.4 mm. Surface glabrous, scalariform reticulate, ribs obtuse, dark-brown to black.  $2n = 12$ .** Native to the Mediterranean and Orient, in waste places, fields, dry slopes, favorite garden plant; in the whole Carpathians.

**835. *Glaucium flavum* Crantz, *G. luteum* Scop.** — Biennial or perennial, up to 30-100 cm high, stems  $\pm$  glabrous or sparsely pubescent. **Seeds 1.4-1.8 x 1.1-1.3 mm. Shape and surfaces similar to *G. corniculatum*, but with surface reticulum more tender and pits shallower, colour mostly brownish-black.  $2n = 12$ .** Native to southern and western Europe; hauling into the Carpathians, ruderal on sandy



and gravelly seashores, waste grounds, vineyards. Hu, Pl, Ro, Sk, Uk.

**836. *Macleaya cordata*** (Willd.) R. Br., *Bocconia cordata* Willd. — Perennial, stems erect, leafy, 1-3 m high, glabrous,  $\pm$  branched above. **Seeds prolonged obovate, aril situated at the bottom and the side, 1.9-2.1 x 1.1-1.3 mm. Surface pitted in longitudinal rows, yellowish- to reddish-brown or brown.** Originally growing in China and Japan; in the Carpathians rarely cultivated in gardens and parks as an ornamental.

#### 45. *HYPECOACEAE*

**837. *Hypocoum procumbens*** L. — Annual, up to 25-30 cm high, glabrous or bristly, ascendent or procumbent with a ground leaf rosette. **Fruits bilobed, many seeded, linear or linear oblong, deflexed, indehiscent to pseudo-dehiscent, 3-4.5 x 2.5-3 mm. Surface pale-brown. Seeds half-circle segments, compressed, without aril, 1.7-2 x 1.5-1.7 mm. Surface dense and minute dotted-tuberculate, brownish-black.** Origin in the Mediterranean, weed of fallows, fields, roadsides, waste places, on sands of sea-shores. Ro.

#### 46. *CLEOMACEAE*

**838. *Cleome spinosa*** Jacq., *C. pungens* Willd. — Annual, stems up to 150 cm, leaves fingerlike, glandular, flowers reddish or white, fruits with gynophore about 6 cm long. **Seeds reniform to discoid, longitudinal compressed, radicle longer than the cotyledons, 1.8-2.2 x 1.8-2 mm. Surface slight lustrous, verrucose, dark-grey.** Native to South America; in the Carpathians often cultivated in pots as an ornamental. Uk.

#### 47. *FUMARIACEAE*

**839. *Corydalis capnoides*** (L.) Pers., *C. gebleri* Ledeb — Annual or biennial, 20-40 cm high, stems ascending or erect, ramified, glabrous, without tuber. **Seeds reniform to circular, slight compressed, margin obtuse, arillate, 1.7-1.9 x 1.9-2.1 mm. Surface glabrous, high lustrous, black, caruncle brownish. 2n = 16.** Native to the Eurasian continent, on screes, shady rocks in mountains, woods, shrubberies, stony grounds. Pl, Ro, Sk, Uk.

**840. *Corydalis cava*** (L.) Schweigg. et Körte, *C. tuberosa* DC. — Perennial, up to 10-35 cm high, stems erect, glabrous, young tuber rounded, later on from

the bottom overturned funnel. **Seeds circular, slight compressed, margin obtuse, transverse section elliptic, 2.2-2.6 x 2.2-2.6 mm. Surface glabrous, lustrous, smooth, black, caruncle brownish. 2n = 16, 32.** Origin in central Europe, in deciduous and wet lowland woods; throughout the Carpathians.

**841. *Corydalis cheilanthesifolia*** Hemsl. — Perennial, stems 15-25 cm high, leaves up to 25 cm long, flowers small, yellow. **Seeds spherical with whitish, later on yellowish aril at the bottom, 1-1.1 x 0.9-1 mm. Surface fine wrinkly, glossy, black.** Native to China; in the Carpathians cultivated in gardens, more often for its large, light green, reddish tinged leaves than for its flowers.

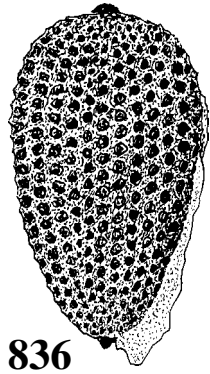
**842. *Corydalis intermedia*** (L.) Link, *C. fabacea* (Retz.) Pers. — Perennial, up to 7-20 cm high, stems erect, glabrous, with small solid tubers. **Seeds circular to reniform circular, margin obtuse, transverse section elliptic, arillate, 1.9-2.1 x 2.1-2.4 mm. Surface glabrous, high lustrous, smooth, black, caruncle brownish. 2n = 16.** Native to northern and central Europe, in woods of the subalpine, seldom montane zone. Br, Pl, Ro, Sk, Uk.

**843. *Corydalis lutea*** (L.) DC., *Pseudofumaria lutea* (L.) Med. — Perennial, up to 12-30 cm high, stems tender, erect, bare, ramified, glabrous, rhizome crawling. **Seeds circular or reniform, hilum with a small prominence, white later brownish caruncle, 1.4-1.7 x 1.6-2 mm. Surface very glisten, distinct glandular, black. 2n = 56, 64.** Originally growing in western Europe, on calcite rocks; often cultivated in gardens and rock-gardens; naturalized in the whole Carpathians.

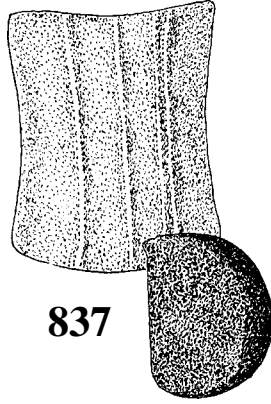
**844. *Corydalis marschalliana*** Pers., *Fumaria marschalliana* Pall. — Perennial, stems 15-40 cm high, leaves oblong-ellipsoidal, mostly whole-brim or 2-3-lobed, flowers pale-yellow or purplish. **Seeds reniform, lateral flattish with a fleshy appendix, arillate, 2.4-2.8 x 2.2-2.6 mm. Surface lineate, smooth, lustrous, blackish.** Native to southeastern Europe, the Asia Minor; rarely cultivated in gardens as ornamental and medical. Mo, Ro, Sk, Uk.

**845. *Corydalis ochroleuca*** Koch, *Pseudofumaria alba* (Mill.) Liden — Perennial, stems 20-40 cm high, unbranched, bare, bluish hoarfrosty, leafy. **Seeds spherical or slight oval, lateral slight flattish, large hilum at the bottom, 1.8-2.2 x 1.4-1.6 mm. Surface dense tuberculate, lustrous, black. 2n = 28.** Native

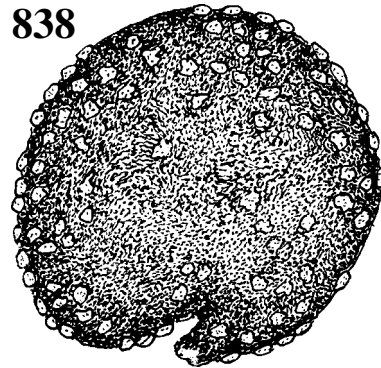




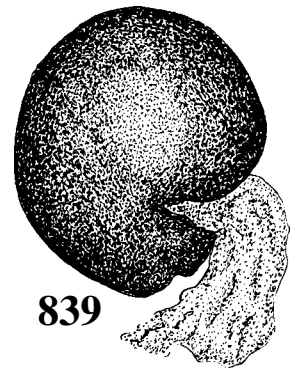
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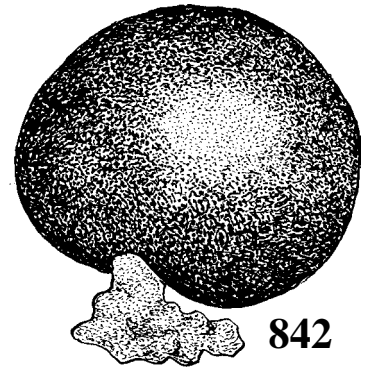
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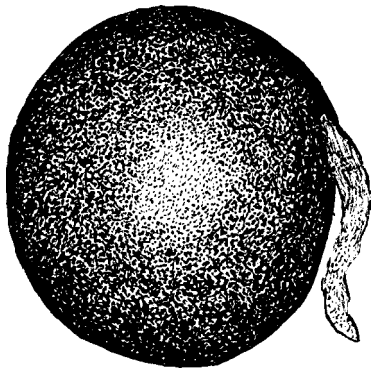
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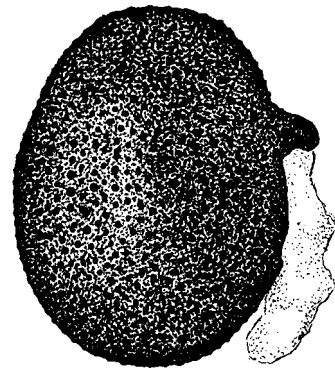
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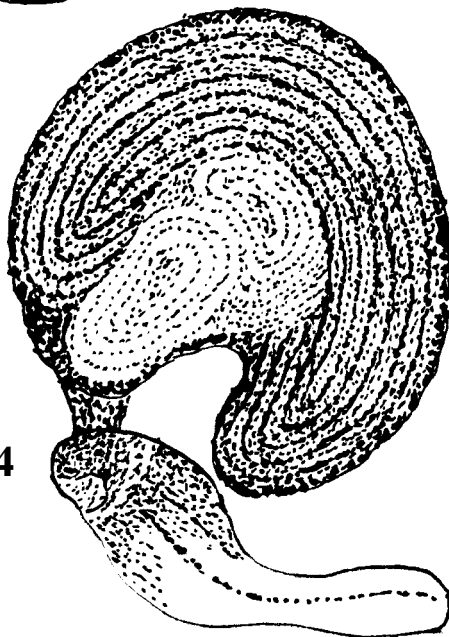
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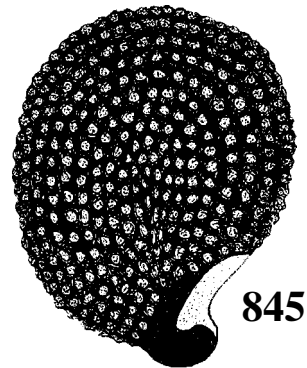
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to southern Europe; in the Carpathians cultivated in gardens as ornamental, uniquely naturalized.

**846. *Corydalis pumila*** (Host) Rchb., *Pistolochia pumila* (Host) Soják — Perennial, 7-20 cm high, stems erect, slender, glabrous, tuber solid. **Seeds circular, margin obtuse, transverse section elliptic, hilum with a caruncle, 1.9-2.1 x 2.2-2.6 mm. Surface glabrous, high lustrous, indistinct areolate, black, caruncle brownish. 2n = 16.** Endemic to central Europe, in shrubberies and light leafy, mostly oak-woods. Hu, Pl, Ro, Sk.

**847. *Corydalis solida*** (L.) Clairv., *C. digitata* (Schränk) Pers., *Fumaria solida* (L.) Mill. — Perennial, up to 10-20 cm high, stems erect, glabrous, tuber rounded, solid. **Seeds circular to circular-reniform, slight compressed, margin obtuse, transverse section elliptic, arillate, 1.6-1.8 x 1.7-1.9 mm. Surface glabrous, high lustrous, black. 2n = 16, (24, 32).** An Euro-Siberian element, in light deciduous woodlands, thickets, edges of woods; in the whole Carpathians.

**848. *Fumaria capreolata*** L. — Annual, up to 20-40 cm high, glabrous, simple or poorly ramified, twining or procumbent. **Fruits achenes, near circular, hilum obtuse, apex with two pale sockets, circumference keeled around with distinct suture, 2.1-2.5 x 1.8-2.2 mm. Surface smooth or fine granular, faint lustrous, greyish-brown. 2n = 64.** Native to southwestern and central Europe, in infertile soils, hauling into gardens, root crops, vineyards; into the whole Carpathians.

**849. *Fumaria densiflora*** DC., *F. micrantha* Lag. — Annual, up to 50 cm high, stems erect or ascendent, parts of leaves narrow, linear, at the most 1 mm. **Fruits achenes, spherical, lateral keeled, pointed on the apex, base truncate surrounded with a stiff gelatinous mound, 2-2.4 x 1.8-2.2 mm. Surface tuberculate, dull, brownish-green. 2n = 32.** Native to western and northern Eurasia, hauling and naturalized in Romania.

**850. *Fumaria officinalis*** L., *F. sturmii* Opiz — Annual, up to 10-40 cm high, stems erect, glabrous or ascendent, ramified, leafy. **Fruits achenes, cordate-elliptic, apex truncate or retuse, base slight narrowed, 2-2.6 x 2.1-3 mm. Surface lustreless, smooth to coarse rugose, olive to medium-buff. 2n = 32.** Native to whole Europe and central

Asia, in weedy places; vegetable fields and gardens; throughout the Carpathians.

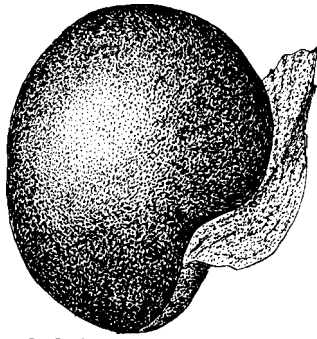
**851. *Fumaria parviflora*** Lam., *F. tenuifolia* G. M. Schulze — Annual, up to 15-30 cm high, glabrous, stems ascendent, leafy, ramified. **Fruits achenes, circular-ovate, distinct keeled, apex with a small beak, 2.3-2.4 x 2.3-2.5 mm. Surface granular rough, brownish-green. 2n = 32.** Originally growing in southern Europe, hauling with flax into the Carpathians, now weed in gardens, fields, vineyards, waste grounds. Hu, Ro, Sk, Uk.

**852. *Fumaria rostellata*** Knaf, *F. transsilvatica* Schur — Annual, up to 15-50 cm high, glabrous, stems erect or ascendent, ramified, leafy. **Fruits achenes, circular or elliptic, apex acute, pointed with two darker pits, at the apex distinct keeled, base truncate, 1.7-2 x 1.8-2.2 mm. Surface fine granular, brownish-green. 2n = 16.** Originally growing in central Europe, weed in fields, gardens, fallow lands, lowlands and uplands. Hu, Mo, Pl, Ro, Sk, Uk.

**853. *Fumaria schleicheri*** Soy.-Will. — Annual, up to 15-50 cm high, glabrous, stems erect or ascendent, ramified, leafy. **Fruits achenes, circular or elliptic, indistinct keeled, with a small beak and two drab pits at the apex, 1.8-2 x 2-2.4 mm. Surface humpy wrinkly, brownish- or dirty-green. 2n = 32.** Origin in eastern Europe and western Asia, as weed in fields, gardens, vineyards, fallows, roadsides, from lowland to the subalpine zone. Hu, Mo, Pl, Ro, Sk, Uk.

**854. *Fumaria vaillantii*** Loisel. — Annual, up to 7-40 cm high, glabrous, stems erect or ascendent, ramified, leafy. **Fruits achenes, circular to elliptic, apex rounded, faint pointed, obscure keeled, apical pits shallow, indistinct keeled, 1.4-1.6 x 1.6-1.8 mm. Surface coarse granular-rugose, blue-green or green. 2n = 32.** In the most part of Europe except the north, the Orient, western Asia, in fields, fallow lands, gardens, parks, forest borders, roadsides, stony banks; throughout the Carpathians.

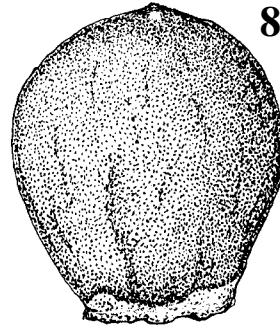
**855. *Dicentra eximia*** (Ker-Gawl.) Torr. — Perennial, up to 30-70 cm high, more minute than *D. spectabilis*. **Seeds reniform, slight flattish, hilum arillate, 1.5-1.9 x 1.7-2.1 mm. Surface strong granular-rugose, slight lustrous, nigrescent-violet.** Originally growing in North America; in the Carpathians often cultivated in gardens as an ornamental.



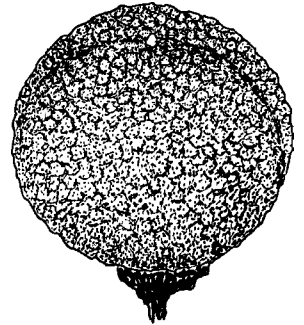
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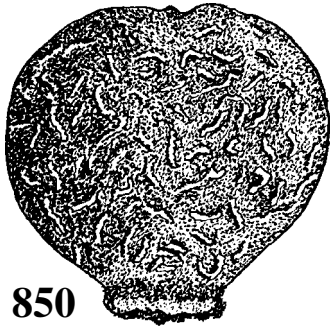
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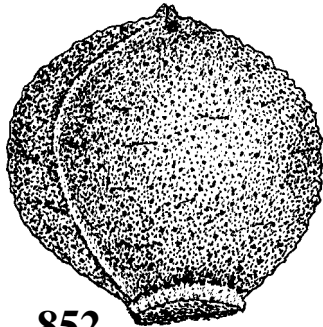
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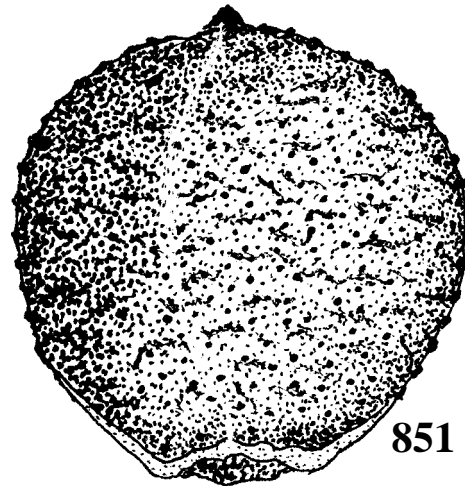
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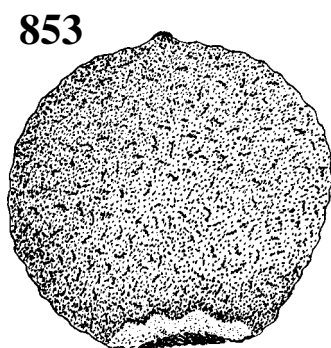
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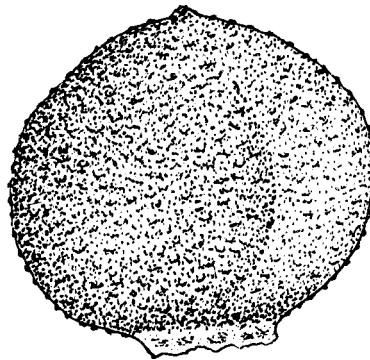
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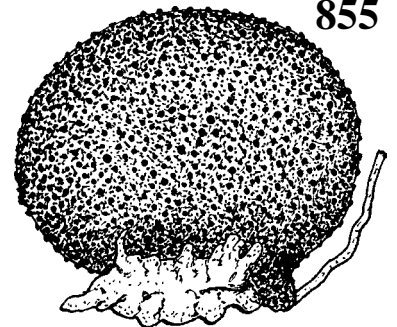
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**856. *Dicentra spectabilis* (L.) Lem., *Fumaria spectabilis* L.** — Perennial, up to 100 cm high, with many leafy, reddish, glabrous, hollow stems. **Seeds circular, hilum arillate, 2.1-2.5 x 2.1-2.5 mm. Surface fine granular-rugose, glossy, dark brownish-violet.  $2n = 16$ .** Native to China and Japan; in the Carpathians very often cultivated in gardens and parks as an ornamental, locally naturalized.

#### 48. RESEDACEAE

**857. *Reseda alba* L., *R. suffruticosa* L.** — Annual to perennial, stems erect, up to 60 cm high, ramified only in upper part. **Seeds reniform, exarillate or with an inconspicuous aril, radicular lobe slight longer than the cotyledonous one, 0.8-1 x 1-1.3 mm. Surface dull, moderate tuberculate, black- to dark-brown.  $2n = 20$ .** Native to southern Europe, in stony or sandy places, disturbed grounds; cultivated in gardens for its fragrant odor.

**858. *Reseda inodora* Rchb., *R. mediteranea* Bess. ex Boiss.** — Biennial or perennial, stems erect, branched above, 20-60 cm high. **Seeds reniform, radicular lobe more mighty, 2-2.5 x 1.5-1.7 mm. Surface lustreless, rough transversal wrinkly, ridges obtuse, yellowish-brown.** Native to south-eastern Europe, in tilled grounds and waste places. Hu, Mo, Ro, Uk.

**859. *Reseda lutea* L., *R. ramosissima* Pourret ex Willd.** — Biennial to perennial, 30-100 cm high, glabrous, bushy, stems erect, mostly unramified. **Seeds obovate or reniform, arillate, radicle lobe longer than the cotyledonous one, 1-1.2 x 1.4-1.8 mm. Surface high glossy, smooth, fine areolate to scalariform, black-brown to black.  $2n = 48$ .** Native to the Mediterranean, spread to central Europe, Asia, western Africa, haul to North America, in weedy places, disturbed grounds; in the whole Carpathians.

**860. *Reseda luteola* L., *Luteola tinctoria* Webb et Berth.** — Biennial, 50-150 cm high, glabrous, stems erect, branched, straight. **Seeds obovate or subreniform, exarillate, radicle lobe slight longer than the cotyledonous one, 0.8-1.1 x 0.7-0.9 mm. Surface high glossy, smooth, fine areolate, red- to dark-brown.  $2n = 24$ .** Origin in the Mediterranean, in stony and sandy places; formerly cultivated as a dye plant; throughout the Carpathians.

**861. *Reseda odorata* L.** — Annual (perennial), up to 15-60 cm high, stems ascending near the base. **Seeds**

**reniform, radicular lobe more mighty, 1.2-1.4 x 1.8-2.1 mm. Surface dull, transversal wrinkly, ridges obtuse, light-brown.  $2n = 12$ .** Originally in northern Africa; cultivated in village gardens for its fragrant flowers used in perfumery; throughout the Carpathians, locally naturalized.

**862. *Reseda phyteuma* L.** — Annual to perennial, up to 10-50 cm high, bare, stems ascendent or erect, ramified from base. **Seeds reniform without sinus, transversal wrinkly, slight flattish, 1.4-1.6 x 1.9-2.5 mm. Surface wrinkly, lustreless, greyish or brown.  $2n = 12$ .** Originally growing in the Mediterranean and eastern Europe, in sunny, waste places, limestone slopes of warmer areas, on cultivated and disturbed grounds. Hu, Pl, Ro, Sk.

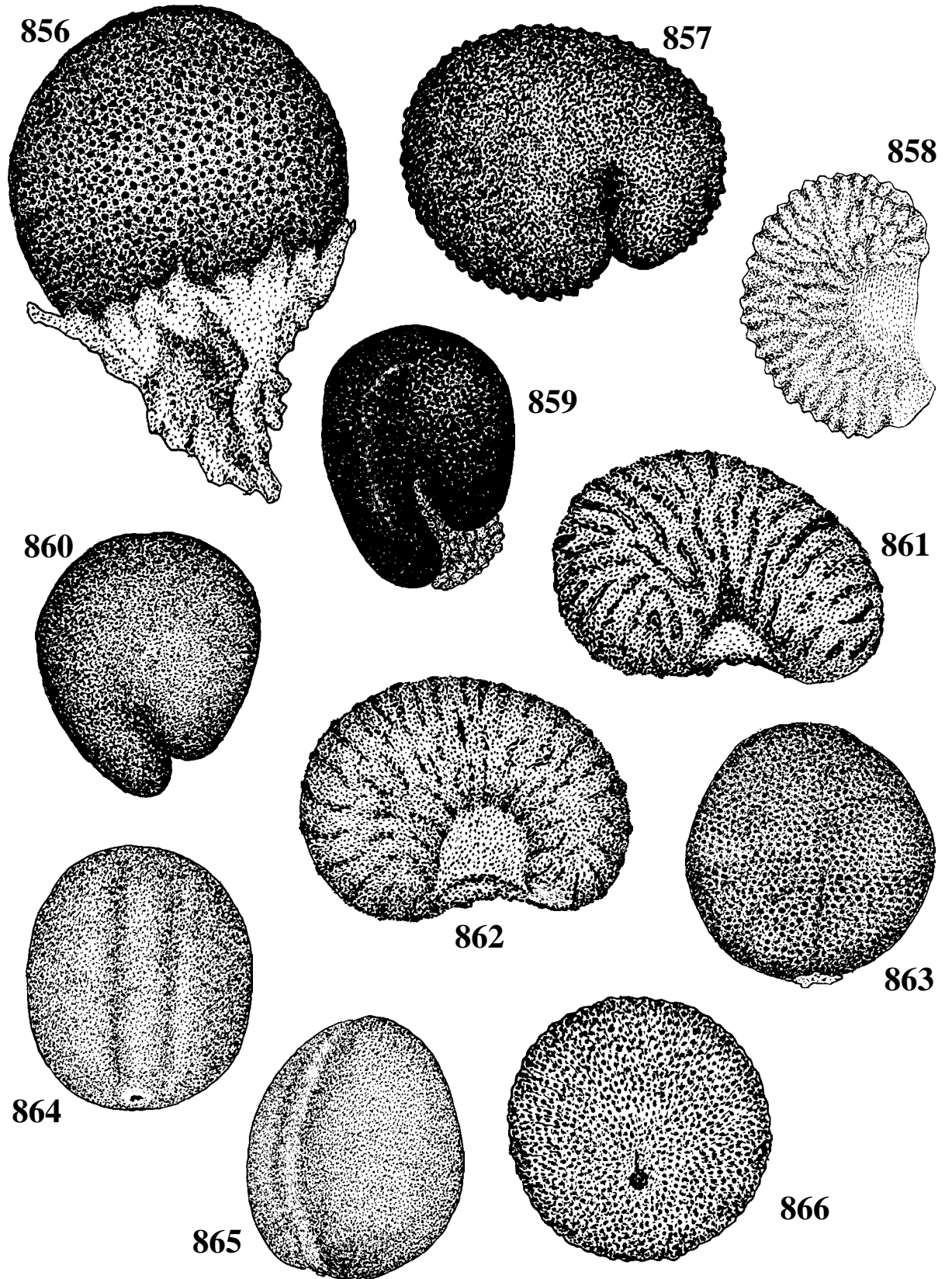
#### 49. BRASSICACEAE

**863. *Brassica carinata* A. Braun, *B. integrifolia* var. *carinata* (A. Braun) O. E. Schulz** — Annual, stems erect, simple, non-woody, 80-150 cm, bare, hoary in the bottom part, often reddish from anthocyanin. **Seeds  $\pm$  irregular spherical, with a indistinct longitudinal furrow and hilum on the ventral side, 1.5-2.2 mm in diam. Surface granulate, lustreless, violetish-brown, with whitish spots.  $2n = 34$ .** Native to Ethiopia and eastern Africa, one from the oldest cultivated species, introduced into Europe, North America and naturalized.

**864. *Brassica chinensis* (L.) Jusl., *B. campestris* subsp. *chinensis* (L.) Mak.** — Leaves and from them formed heads are prolonged and yellow-green. **Seeds spherical or cylindrical, transversal circular or slight compressed, 1.7-2 x 1.5-1.8 mm. Surface fine reticulate, reticulum broad, reddish- to dark-brown.** Native to eastern Asia; in the Carpathians seldom cultivated as a leafy vegetable.

**865. *Brassica elongata* Ehrh., *Eruca elongata* (Ehrh.) Baumg.** — Biennial to perennial, 60-120 cm high, stems bristly at base, else bare, richly branched. **Seeds ovate-elliptic with a long broad furrow, 1-1.3 x 0.9-1.2 mm. Surface relative smooth, lustreless, red- or greyish-brown.  $2n = 22$ .** Originally growing in southeastern Europe as far as central Asia; hauling into the Carpathians on cultivated fields, steppes, dry rocky slopes. Hu, Mo, Ro, Sk, Uk.

**866. *Brassica fruticosa* Cyr.** — Annual to perennial, stems 30-50 cm high, erect, lower leaf with a long stalk. **Seeds oval, with a rounded hilum at the**



bottom, 0.8-1 mm in diam. Surface fine reticulate-foveolate, lustreless, reddish-brown. Native to the Mediterranean territories, rarely hauling into the Carpathians on disturbed grounds.

**867. *Brassica juncea* (L.) Czern., *Sinapis juncea* L.** — Annual, up to 60-100 cm high, stems bristly at the bottom, else glabrous, branched above, branches long, erecto-patent. **Seeds circular or ellipsoid, slight compressed or rounded, radicle mostly invisible, 1.3-2 x 1.3-1.8 mm. Surface lustrous, fine reticulate, orange-yellow, yellow greyish or reddish-brown. 2n = 36.** Originally growing in southeastern Asia; seldom cultivated and used in food-preserving industry (mustard) and for green manuring. Br, Hu, Mo, Ro, Sk, Uk.

**868. *Brassica napus* L., *Rapa napus* (L.) Mill.** — Annual or biennial, stems erect, up to 50-150 cm high, mostly ramified, leafy, probably a hybrid of *B. oleifera* x *rapa*. **Seeds circular or ovate-ellipsoid, slight compressed, radicle distinct or indistinct, 1.8-2.2 x 1.6-2.1 mm. Surface oily lustrous, reticular ribs low and indistinct, red- or greyish-black. 2n = 38.** Origin unknown. Cultivated in 2 convar.: *napus* (a) with a higher contents of oil (38-45 %) and *napobrassica* (b) (L.) Rchb. with beetly shorted roots and stem bases, fleshy, used as a vegetable and fodder.

**869. *Brassica nigra* (L.) W. D. J. Koch, *Sinapis nigra* L.** — Annual, 20-150 cm high, stem strigose below, bare above, much branched. **Seeds ± spherical, fine reticulate-foveolate, 1.5-1.7 mm in diam. Surface reddish-brown. 2n = 16.** Native perhaps in the western Mediterranean, in moist fields, boundaries, riverbanks; in the Carpathians seldom cultivated for seed (mustard production), or hauling and naturalized.

**870. *Brassica oleracea* L., *Napus oleracea* (L.) K. F. Schimp. et Spenn.** — Annual to biennial or perennial, stems of some convarieties up to 2 m high, wooden at base, sometimes coarsed, leaves fleshy. Native to seashores of Europe, stony and rocky soils. The source of many convarieties and forms cultivated as vegetable, oil plant or fodder for animals. **2n = 18.** In the Carpathians the cvs can intensely been grown in seven following convarieties. Native to Europe, on maritime cliffs, in the Mediterranean and Adriatic coasts.

**870a. *Brassica oleracea* L. convar. *botrytis* (L.) Markgr., *Brassica cauliflora* (DC.) Gars.** — Inflorescence with stem and stalks shorted into a white, granular head surrounded with ovate leaves, flowering in the first year. **Seeds usually ovate, lateral view slight compressed, transversal section elliptic, 1.8-2.2 x 1.6-2 mm. Surface lustreless, ribs of the reticulum low and indistinct, red- or nut-brown.** Commonly cultivated as a vegetable (Cauliflower).

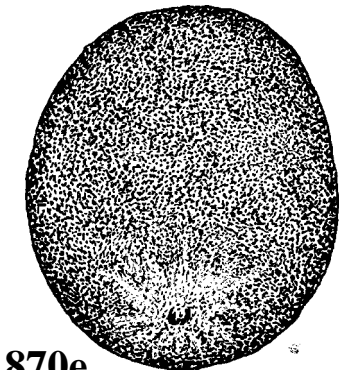
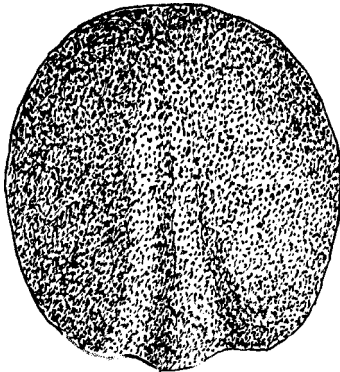
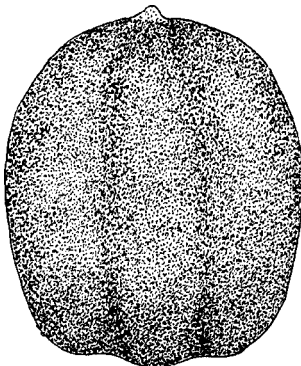
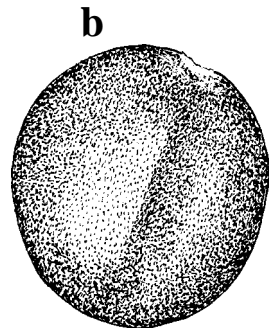
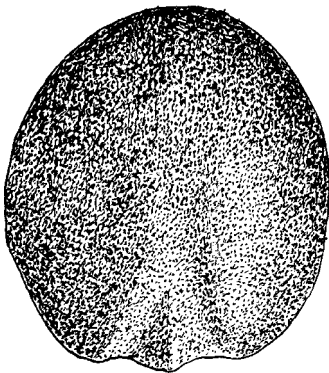
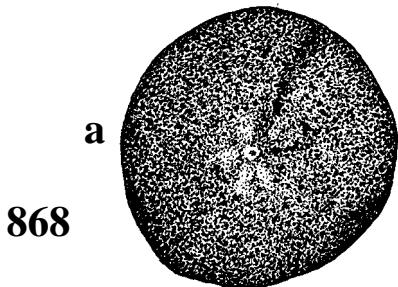
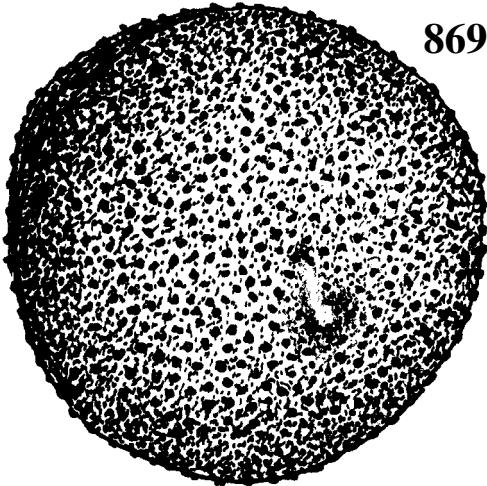
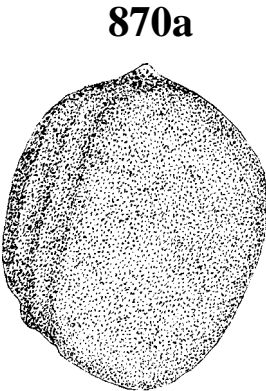
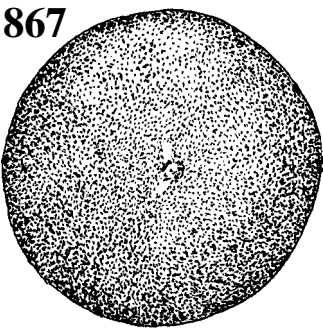
**870b. *Brassica oleracea* L. convar. *capitata* (L.) Alef.** — Stems shorted, leafs firmly heaped up, (Cabbage), flowering in the second year. **Seeds usually ovate-ellipsoid, lateral view slight compressed, transversal section elliptic, 2-2.5 x 1.8-2.2 mm. Surface slight reticulate, dark greyish-brown.** Commonly cultivated as a vegetable (Cabbage) in two forms: *alba* DC and *rubra* (L.) Thell.

**870c. *Brassica oleracea* L. convar. *gemmifera* (DC.) Markgr.** — Stems up to 2 m high, in leaves armpit small roundish headlets of accumulated leaves. **Seeds usually slight ovate or ellipsoid, 2.3-2.7 x 2-2.4 mm. Surface minute reticulate-foveate, dull, greyish-brown.** Commonly cultivated as a vegetable (Rosette-kale).

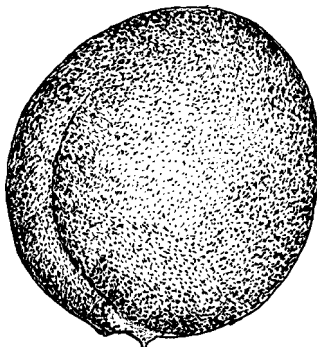
**870d. *Brassica oleracea* L. convar. *gongylodes* (L.) Markgr.** — Stems at the bottom spherical shorted into a globe bulb, leafy, flowering in the second year. **Seeds usually elliptic-spherical, slight compressed, transversal section elliptic, 1.7-2.1 x 1.5-1.8 mm. Surface lustreless, glabrous, fine reticulate-foveate, dark greyish-brown.** Commonly cultivated as a vegetable (Kohlrabi), often in the form *violacea* hort.

**870e. *Brassica oleracea* L. convar. *italica* (Plenck) Markgr.** — Inflorescence with stem shorted into a green, granular head, more free than in the cauliflower, flowers sparsely, stunted. **Seeds ± spherical or slight elliptic, transversal section ± rounded, 2-2.4 x 1.9-2.1 mm. Surface fine reticulate-foveate, lustreless, greyish- or reddish-brown.** Commonly cultivated as a very palatable vegetable, rich in vitamins.

**870f. *Brassica oleracea* L. convar. *sabauda* (L.) O. E. Schultz** — Leaves deeply-green, crispy, forming a loose spreading head. **Seeds ± spherical, 1.8-2.2 x 1.7-2.1 mm. Surface slight reticulate-foveate, lustreless, dark-greyish-brown.** Commonly cultivated as a vegetable (Headed kale).



870d



870f

870c

**870g. *Brassica oleracea* L. convar. *viridis* (L.) Markgr., *B. oleracea* subsp. *acephala* DC.** – Leaves feathery lobed, upper leaves undivided, curly. **Seeds spherical or elliptic, transversal mostly elliptic, 1.8-2.4 x 1.6-2.2 mm. Surface smooth, reticulum distinct or indistinct, reddish-brown.** Rarely cultivated as morrow-stemcale (Kale or Curlykale).

**871. *Brassica pekinensis* (Lour.) Rupr., *B. rapa* subsp. *pekinensis* (Lour.) Hanelt** – Biennial, leaves headly heaped up, heads oblong-ovoid, compact at base, gently loose and soft in the upper part, up to 50 cm high, leaves pale-green, with a pulpy main leafy vein. **Seeds  $\pm$  rounded, lateral slight compressed, 1.6-1.8 x 1.5-1.6 mm. Surface fine granulate, lustreless, dark-grey.** Native to China; in the Carpathians cultivated as leafy vegetable.

**872. *Brassica rapa* L., *B. campestris* L.** – Annual to biennial, 70-100 cm high, stems mostly ramified. **Seeds spheroidal, slight compressed, radicular ridge indistinct to distinct, hilum convex or plane, 1.5-2 x 1.4-1.9 mm. Surface lustrous, reticulate, purple- to red-brown.  $2n = 20$ .** Native probably to southwestern Europe. Existing forms can be divided into 3 subsp.: **a - *oleifera* (DC.) Metzg.** with higher contents of oil (about 30 %), **b - *rapa* L.** with beetly shorted or globular roots, cultivated for edible taproot, **c - *campestris* (L.) Clapham** as weed in fields and waste grounds; in the whole Carpathians.

**873. *Brassica tournefortii* Gouan** – Annual, stems erect, leaf beneath bristle. **Seeds spherical, transversal section rounded, 1.4-1.6 mm in diam. Surface fine reticulate-foveolate, lustreless, reddish-brown, dark-brown around the spherical hilum.** Native to the Mediterranean; uniquely hauling into the Carpathians.

**874. *Sinapis alba* L., *Brassica alba* (L.) Rabenh.** – Annual, bristly, 30-80 cm high, stems erect, ramified, angular. **Seeds ovate-circular, lateral view slight flattish, radicular ridge indistinct, 1.8-2.6 x 1.8-2.6 mm. Surface lustreless, reticulum low and indistinct, smooth, pale to light buff-yellow.  $2n = 24$ .** Native to the Mediterranean, naturalized throughout the rest of Europe, weed of tilled areas; cultivated as an oil-yielding plant (25-35 % oil in seeds) for mustard production; naturalized throughout the Carpathians.

**875. *Sinapis arvensis* L., *Brassica arvensis* (L.) Rabenh.** – Annual, stems 30-60 cm high, erect, leafy,

ramified, at base bristly, sometimes glabrous. **Seeds globose, transverse section circular, radicular ridge invisible, 1.4-2 x 1.4-2 mm. Surface lustreless, reticulum low, indistinct, glabrous, reddish-brown to blackish.  $2n = 18$ .** Originally probably growing in the Mediterranean, now nearly cosmopolitan, weed of arable lands and waste places; in the whole Carpathians.

**876. *Sinapis dissecta* Lag., *Brassica dissecta* (Lag.) Boiss** – Annual, up to 30-60 cm high, hirsute at base, ramified, stem and branches slender. **Seeds globular, slight compressed, radicle distinct, 2.9-3.2 x 2.6-2.9 mm. Surface opaque, often with a whitish cover, dark greyish-brown or brown.  $2n = 24$ .** Native to the Mediterranean, weed of arable land (mostly in flax-fields), naturalized in several territories. Hu, Ro, Uk.

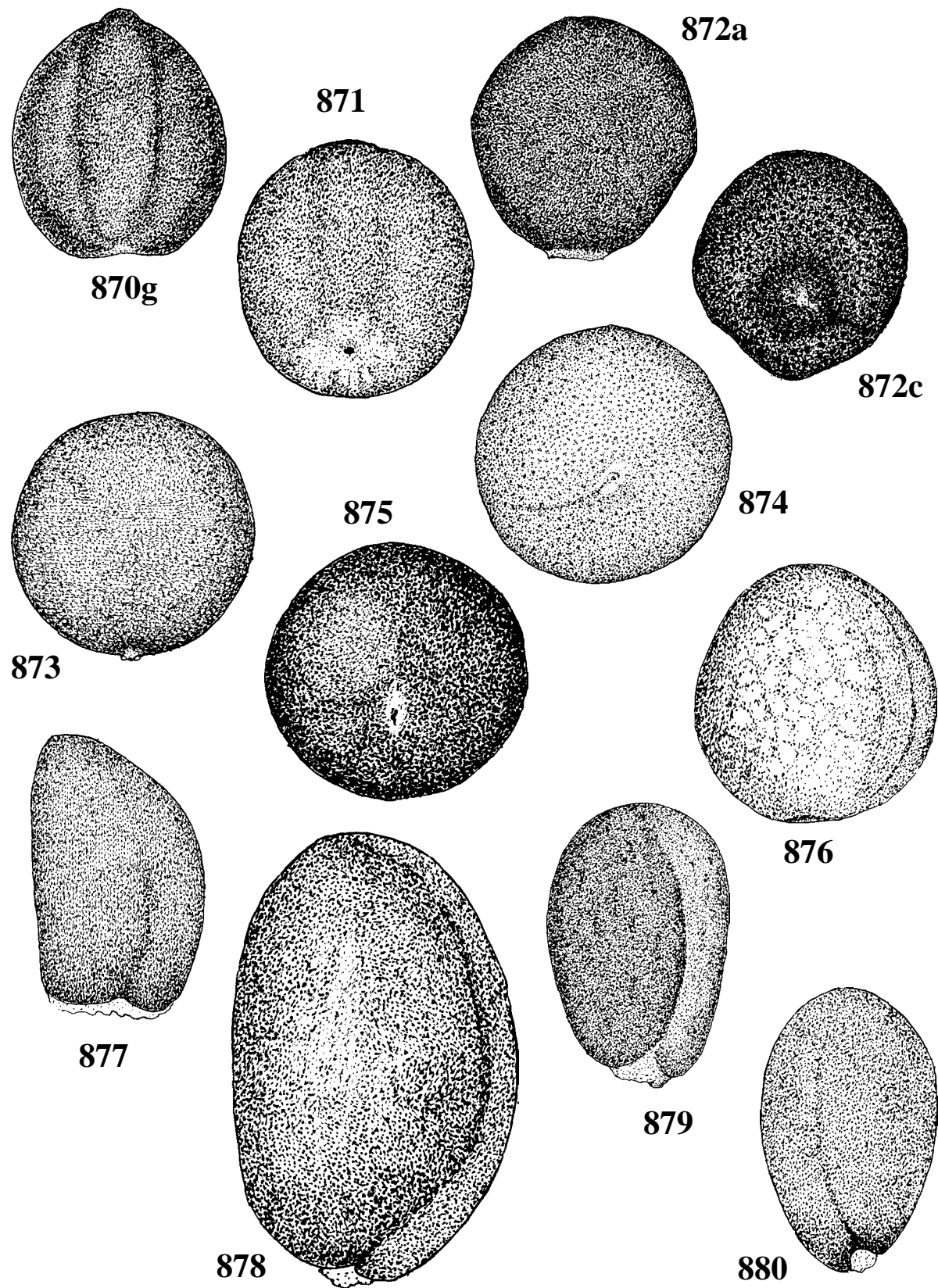
**877. *Diplotaxis erucoides* (L.) DC., *Sinapis erucoides* Torn.** – Annual or overwintering, 20-50 cm high, stems with rosette leaves below, erect or ascending. **Seeds ellipsoid, apex slanting on one side, radicle as long as cotyledons, 1-1.2 x 0.7-0.8 mm. Surface smooth, lustreless, yellowish-brown.  $2n = 14$ .** Origin in the Mediterranean, as noxious weed on heavy alluvial soils, casual in central Europe. Ro.

**878. *Diplotaxis muralis* (L.) DC., *Sinapis muralis* (L.) R. Br.** – Annual, biennial or perennial, usually many-stemmed, 20-50 cm high, glabrous or bristly hirsute at base, branched, little leafy. **Seeds ellipsoid, compressed, lateral view elliptic, radicle expressive, 1-1.4 x 0.7-0.9 mm. Surface opaque, smooth, yellowish- to dark-brown.  $2n = 42$ .** Place of origin the Mediterranean and central Europe, casual elsewhere on fallow lands, vineyards, roadsides in warmer areas; in the whole Carpathians.

**879. *Diplotaxis tenuifolia* (L.) DC., *Eruca tenuifolia* (L.) Moench** – Perennial, stems 30-80 cm, woody at the base, glabrous or sparsely hispid below. **Seeds ellipsoid, lateral view slight compressed, margin blunt, 1-1.3 x 0.7-0.9 mm. Surface smooth, rare faint reticulate, orange- or greyish-brown.  $2n = 22$ .** Native to southern and central Europe, the Orient, northern Africa, in waste places, roadsides, fallow lands, fields. Hu, Mo, Pl, Ro, Sk, Uk.

**880. *Diplotaxis viminea* (L.) DC., *Sisymbrium vimineum* L.** – Annual, a slender plant, 10-30 cm high with ground rosette of leaves, some stems without





leaves, glabrous or sparsely hairy. **Seeds ovate, compressed, radicle a little longer than cotyledons, 0.9-1.1 x 0.6-0.8 mm. Surface smooth, yellowish-brown.** Originally growing in southern Europe, causal in central Europe, southwestern Asia, in sandy, calcareous soils of fields, vineyards, gardens, waste places. Ro, Uk.

**881. *Eruca sativa* Mill., *E. vesicaria* subsp. *sativa* (Mill.) Thell.** – Annual or biennial, coarsely hispid, 20-100 cm high, ramified, foetid after crushing. **Seeds elliptic-ovate, slight flattish, radicle as long as cotyledons, 1.9-2.3 x 1.6-1.9 mm. Surface faint reticulate, dull, yellowish- or greyish-brown. 2n = 22.** Origin in the Mediterranean region, as weed in fields and waste places; previously cultivated as an oil-yielding and salad plant, often naturalized. Hu, Mo, Pl, Ro, Uk.

**882. *Erucastrum gallicum* (Willd.) O. E. Schulz, *Hirschfeldia gallica* (Willd.) Fritsch** – Annual or biennial, stems 30-60 cm, ascendent, densely leafy. **Seeds elliptic or obovate, apex rounded, radicle and cotyledons equal in length, 1.2-1.4 x 0.7-0.9 mm. Surface barely lustrous, reticulate, orange-brown. 2n = 30.** Native to central and southern Europe, on fallow lands, waste grounds, roadsides, trenches, silts of rivers and brooks. Hu, Pl, Ro, Sk, Uk.

**883. *Erucastrum nasturtiifolium* (Poir.) O. E. Schulz, *E. obtusangulum* (Schleich.) Rechb., *Hirschfeldia erucastrum* auct. non (L.) Fritsch.** – Biennial to perennial, 40-80 cm high, stems erect, angular, densely hispid below. **Seeds elliptic, radicle as long as cotyledons, 1.3-1.5 x 0.8-1 mm. Surface faint reticulate, light- up to reddish-brown. 2n = 16.** Originally growing in southwestern Europe, hauling on waste grounds, roadsides, rocky slopes, fallow lands of warmer areas. Hu, Pl, Ro, Sk, Uk.

**884. *Hirschfeldia incana* (L.) Legréze-Fossat, *Erucastrum incanum* (L.) Koch** – Annual to biennial, up to 150 cm high, stems erect, ramified, densely hirsute. **Seeds elliptic-ovate, apex rounded, base cut, furrow indistinct, 1.3-1.6 x 0.7-0.9 mm. Surface dull, prolonged reticulate, reddish-brown. 2n = 14.** Native to southern Europe, hauling into the southern part of the Carpathians, as weed in fields and waste grounds, up to 900 m elevation. Hu, Sk, Uk.

**885. *Erucaria hispanica* (L.) Druce, *E. tenuifolia* DC., *E. myagroides* (L.) Halácsy** – Annual or biennial, stems erect, glabrous, branched, leafy, hirsute

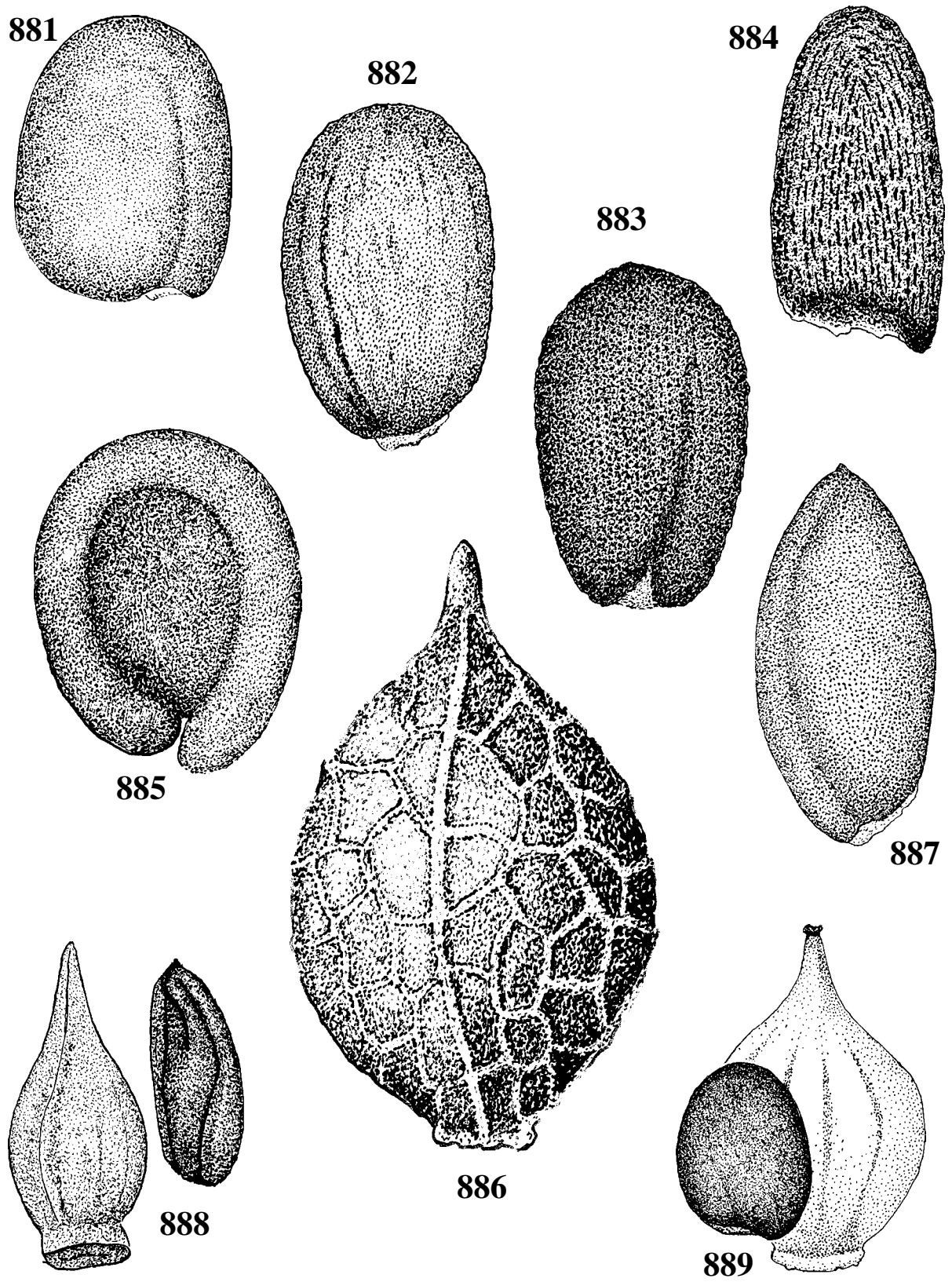
only at bottom. **Seeds elliptic or rounded, tip of the radicle a little longer than the cotyledons, 1.2-1.8 x 1-1.2 mm. Surface smooth, greenish-yellow to brown.** Native to the eastern Mediterranean region; sometimes hauling into the Carpathians on tilled lands and waste places.

**886. *Calepina irregularis* (Asso) Thell., *Myagrum irregulare* Asso, *Rapistrum bursifolium* Berg., *Bunias cochlearioides* Willd.** – Annual, stems 20-80 cm high, branched, ascendent, glabrous, leafy. **Fruits achenes, elliptic, apex gradually narrowed into a straight beak, 3.5-3.9 x 2.2-2.4 mm. Surface distinct reticulate, with a suture on both sides, dirty pale-brown. 2n = 14, 18, 42.** Originally growing in southern Europe, on steppes, dry slopes, waste places; hauling northward into the Carpathians on sunny slopes. Hu, Ro, Uk.

**887. *Cakile baltica* (Jord. ex Rouy et Foucaud) Pobed., *C. maritima* subsp. *baltica* (Jord. ex Rouy et Foucaud) Hyl** – Annual, stems 15-60 cm high, branched, ascendent or decumbent, leaves variable. **Seeds irregular ovate, apex pointed, base seems to be cut, the radicular margin convex, the cotyledons concave, 4.6-6 x 2.1-2.7 mm. Surface barely lustrous, smooth to slight rough, reddish-brown. 2n = 18.** Originally growing in sea coasts of Europe, northwards to 65°N, seldom hauling into inland in saline soils. Pl, Sk.

**888. *Cakile maritima* Scop., *Bunias cakile* L.** – Annual, stems 15-40 cm high, cylindrical, glabrous, decumbent or ascendent, usually branched. **Fruits silicles (of two unequal, one-seeded joints), 2-3 seeded (1 in valve and 1-2 in beak) 12-27 mm long; non-fleshy (corky), lomentaceous (the upper joint breaking off, the lower persistent), 12-15 x 5-6 mm. Seeds irregular ovate or oblong ovate, radicle longer than the cotyledons, not mucous, 4.6-6 x 2.1-2.7 mm. Surface punctulate, slight lustrous, reddish-brown. 2n = 18.** Native to the European sea coasts, northwards to 65°N, seldom hauling into the inland of the Carpathians, on saline soils. Ro, Sk.

**889. *Rapistrum perenne* (L.) All., *Myagrum perenne* L.** – Biennial or perennial, up to 30-80 cm high, stems densely hispid below, glabrous and ramified above. **Fruits silicles, biloments, bipartite, upper part ovoid, 1-seeded, deciduous, with 8 ribs gradually narrowed into a short conical beak, 4.3-5.2 x 2.8-3.2 mm; bottom part cylindrical, 1-seeded. Surface glabrous. Seeds elliptic, faint retic-**



ulate, 2.3-2.7 x 1.8-2 mm. Surface reddish-brown, slight lustrous.  $2n = 18$ . Origin in central and eastern Europe, in fields, waste grounds, pastures, roadsides, in warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**890. *Rapistrum rugosum*** (L.) All., *Myagrum rugosum* L. — Annual or biennial, stems 20-60 cm high, bluntly angular, hispid below, glabrous above, ramified from the base. **Fruits silicles, biloments, bipartite, bottom part without seeds, short; upper part 1-seeded, rounded, gradually narrowed into a beak, 3.8-4.5 x 2.3-2.7 mm. Surface ribbed, hirsute, dirty-yellow. Seeds ellipsoid-ovate, cut on both sides, 1.7-2 x 1.3-1.5 mm. Surface smooth, dull, yellowish-brown.  $2n = 16$ .** Originally growing in southeastern Europe, southeastern and central Asia, on roadsides, fields, boundaries; hauling into the Carpathians mostly with cereals. Mo, Pl, Ro, Sk, Uk.

**891. *Crambe abyssinica*** Host ex Fries, *C. hispanica* auct. non L. — Annual, a slender, densely hirsute plant, 25-100 cm high. **Fruits silicles, bipartite, rounded, smooth, 3-5 x 3-5 mm. Surface whitish-yellow. Seeds rounded or elliptic, usually with a long, string-form hilum, 2-2.5 x 1.8-2.2 mm. Surface glabrous, dark-brown.  $2n = 60$ .** Originally growing in southern Europe and Africa, as weed in fields, seldom hauling northwards into the Carpathians, rarely cultivated as oil-yielding plant.

**892. *Crambe maritima*** L. — Perennial, glabrous, 30-75 cm high, stems much-ramified. **Fruits silicles, upper part 1-seeded, globose, 4-angular. Seeds elliptic compressed, radicular ridge distinct with one or two furrows on either side, usually with a long, string-form hilum, 4-4.8 x 3.2-4 mm. Surface rough, indistinct reticulate, brown, henna.  $2n = 60$ .** Originally growing in the Atlantic Sea coast, on cliffs, sands and stony shores; in the Carpathians previously cultivated as a vegetable (etiolated shoots), sometimes naturalized.

**893. *Crambe pontica*** Stev. ex Rupr., *C. maritima* M. Bieb. non L. — Perennial, stems 40-60 cm, leaves fleshy, oblong or nearly rounded. **Fruits silicles, roughwal, woody cover, 7.8-9.2 x 6.9-7.5 mm. Seeds  $\pm$  rounded, lateral slight compressed, with a long string-form hilum at apex, 3.5-3.9 x 3.7-4.1 mm. Surface slight undulated, on one side with a longitudinal furrow, dull, reddish or dark-brown. Native to the Black and Azorean Sea coasts. Uk.**

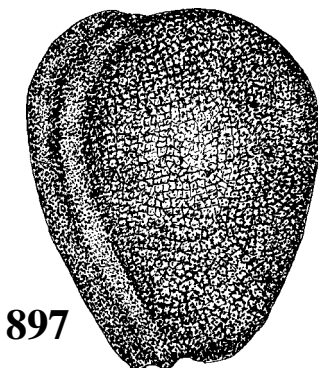
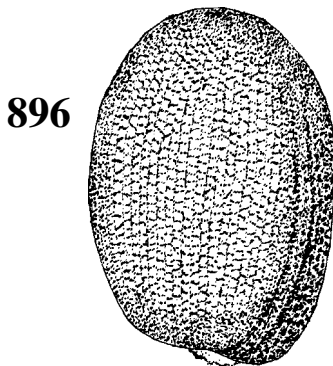
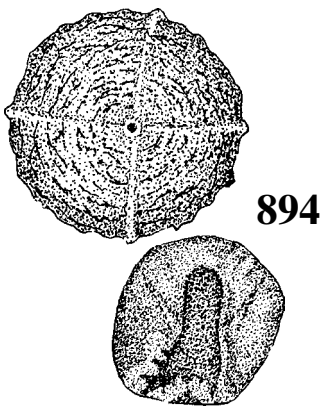
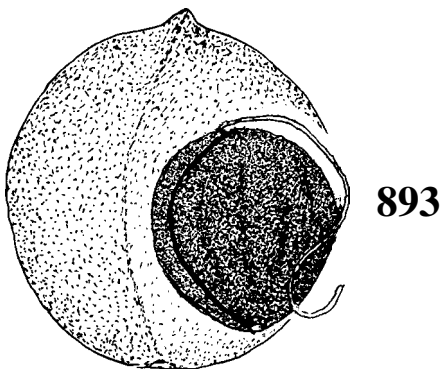
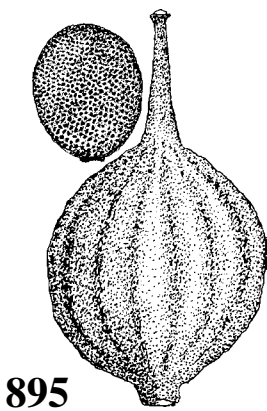
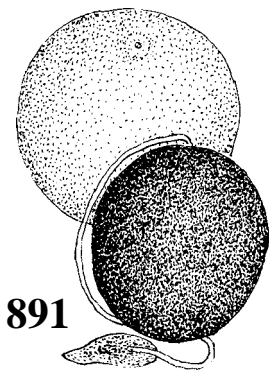
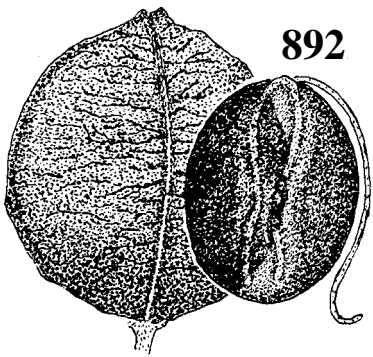
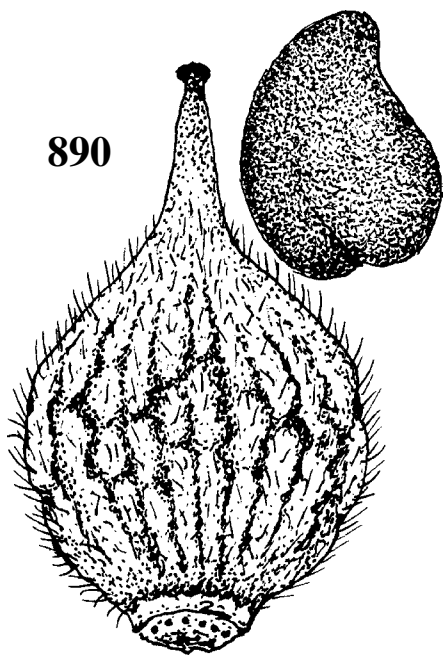
**894. *Crambe tataria*** Seb  ok, *C. aspera* auct. non M. Bieb. — Perennial, 60-120 cm high, stems erect, angular, ramified from the base, subglabrous to densely hispid. **Fruits silicles, rounded with fourth suture, 4.5-5.5 mm in diam. Surface plicate, yellowish-brown. Seeds irregular rounded, compressed, 3-3.8 mm in diam. Surface faint wrinkly, dull, dark-brown.  $2n = 30$ .** An European, Pontic-Pannonian species of steppes, stony slopes and meadows of warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**895. *Raphanus maritimus*** Smith, *Raphanistrum odessanum* Andr  . — Annual, stems up to 30-100 cm high. **Fruits siliquae usually elongated, biarticulated; lower part very short, inconspicuous, stalk-like, slender, seedless; upper part elongated, + constricted between the seeds and apex narrowing  $\pm$  into a seedless beak-like structure; pods breaking into 1-seeded joints at maturity, or cylindrical and breaking into parts (indehiscent); septum complete in the short sterile lower part, 7.6-9 x 5.5-6.5 mm. Seeds  $\pm$  spherical or ovoid, 3-5 x 2-4 mm. Surface fine shallow foveolate, lustreless, violetish-brown. Native to the Black Sea coastal region, on maritime sands. Uk.**

**896. *Raphanus raphanistrum*** L., *Rapistrum raphanistrum* (L.) Crantz — Annual, stems erect, 20-120 cm high, ramified, angular, more or less hispid, leafy. **Seeds ovoid or spherical, slight compressed, transverse section elliptic to almost circular, radicular ridge rather distinct, 2.8-3.2 x 1.6-2.1 mm. Surface bare lustrous, fine reticulate, purple-brown to dark-brown.  $2n = 18$ .** Originally growing in the Mediterranean region, secondary circumpolar, throughout Europe. A weed of cultivated fields, waste grounds, roadsides; throughout the Carpathians.

**897. *Raphanus sativus*** L., *R. officinalis* Crantz — Annual or biennial, stems 20-100 cm high, branched, glabrous or bristly. **Seeds elliptic or subovate, slight compressed, not ribbed, transverse section elliptic, 3-3.8 x 2.2-3 mm. Surface reticulum distinct, light nut-brown or reddish-brown with a greyish tinge.  $2n = 18, 36$ .** Origin unknown; cultivated throughout the Carpathians for its edible root as Radies [subsp. *sativus*] with a spherical hypocotyl, or as Rettich [subsp. *niger* (Mill.) DC.] with a large black, beet tart biting root.

**898. *Conringia austriaca*** (Jacq.) Sweet, *Erysimum austriacum* (Jacq.) DC. — Annual, up to 20-100 cm,



glabrous, stems erect, seldom branched. **Seeds ovoid or elliptic prolonged, apex rounded, cotyledons incumbent. 2.4-3 x 1.2-1.5 mm. Surface expressive granulose, dull, dark-cinnamonic. 2n = 28.** Native to south-eastern and eastcentral Europe, on cultivated grounds and waste places, very rarely, in the warmest territories in Hu, Ro, Sk.

**899. *Conringia orientalis* (L.) Dumort., *Erysimum orientale* (L.) Crantz** — Annual, 10-60 cm high, glabrous, stems erect, seldom ramified, roundish. **Seeds ovoid or elliptic, radicle coarse, furrowed on both sides, 2.2-2.6 x 1.3-1.6 mm. Surface distinct reticulate, slight lustrous or dull, dark-brown. 2n = 14.** Native to central and eastern Europe on cultivated grounds, fallow fields, road borders, embankments, frequently naturalized. Hu, Mo, Pl, Ro, Sk, Uk.

**900. *Lepidium campestre* (L.) R. Br., *Thlaspi campestre* L.** — Annual or biennial, 20-60 cm high, stems erect, densely leafy, ramified on the upper part. **Seeds obovate, often excentric on the cotyledonary side, or elliptic, slight angled-pointed at base, 2.1-0.5 x 1.4-1.6 mm. Surface lustreless, velvety like, papillose, prickly, brown to dark-brown. 2n = 16.** Native throughout Europe, in weedy places, fields and waste grounds; in warm situations of the whole Carpathians.

**901. *Lepidium crassifolium* Waldst. et Kit., *L. borysthenicum* Kleopov** — Perennial, stems ascendent and erect, 10-30 cm high, very flexuous, papillose, branched above. **Seeds obovate, flattish, margin rounded, slight angled-pointed at base, radicle length equal to that of the cotyledons, 1.8-2.3 x 1-1.3 mm. Surface minute reticulate, lustreless, radical furrow marked on each side, light-brown, ferruginous. 2n = 16.** Native to southeastern Europe, in saline areas and steppe sites. Hu, Mo, Ro, Sk, Uk.

**902. *Lepidium densiflorum* Schrad., *L. apetalum* auct. non Willd.** — Annual or biennial, 20-40 cm high, stems erect, hirsute, single, branched above. **Seeds subovate or elliptic, apex margin winged, tips of radicle and cotyledons acute equal in length, radicular furrow distinct, 1.2-1.6 x 0.7-0.9 mm. Surface bare lustrous, fine papillose, orange-brown. 2n = 32.** Originally from North America, introduced and widely naturalized in Europe, in sandy and gravelly soils, roadsides, railways. Hu, Mo, Pl, Ro, Sk, Uk.

**903. *Lepidium graminifolium* L.** — Perennial, up to 10-70 cm high, stems erect, shortly hirsute till

glabrous, leafy, ramified above. **Seeds elliptic or obovoid, tips of radicle and cotyledons equal in length, radicular furrow distinct, 1.2-1.5 x 0.7-0.8 mm. Surface slight lustrous, humpy, pale- or dark-brown. 2n = 16.** Native to southern Europe, on waste places, along roads, vineyards, railways, dry open slopes, in sandy and loamy soils. Hu, Ro, Sk, Uk.

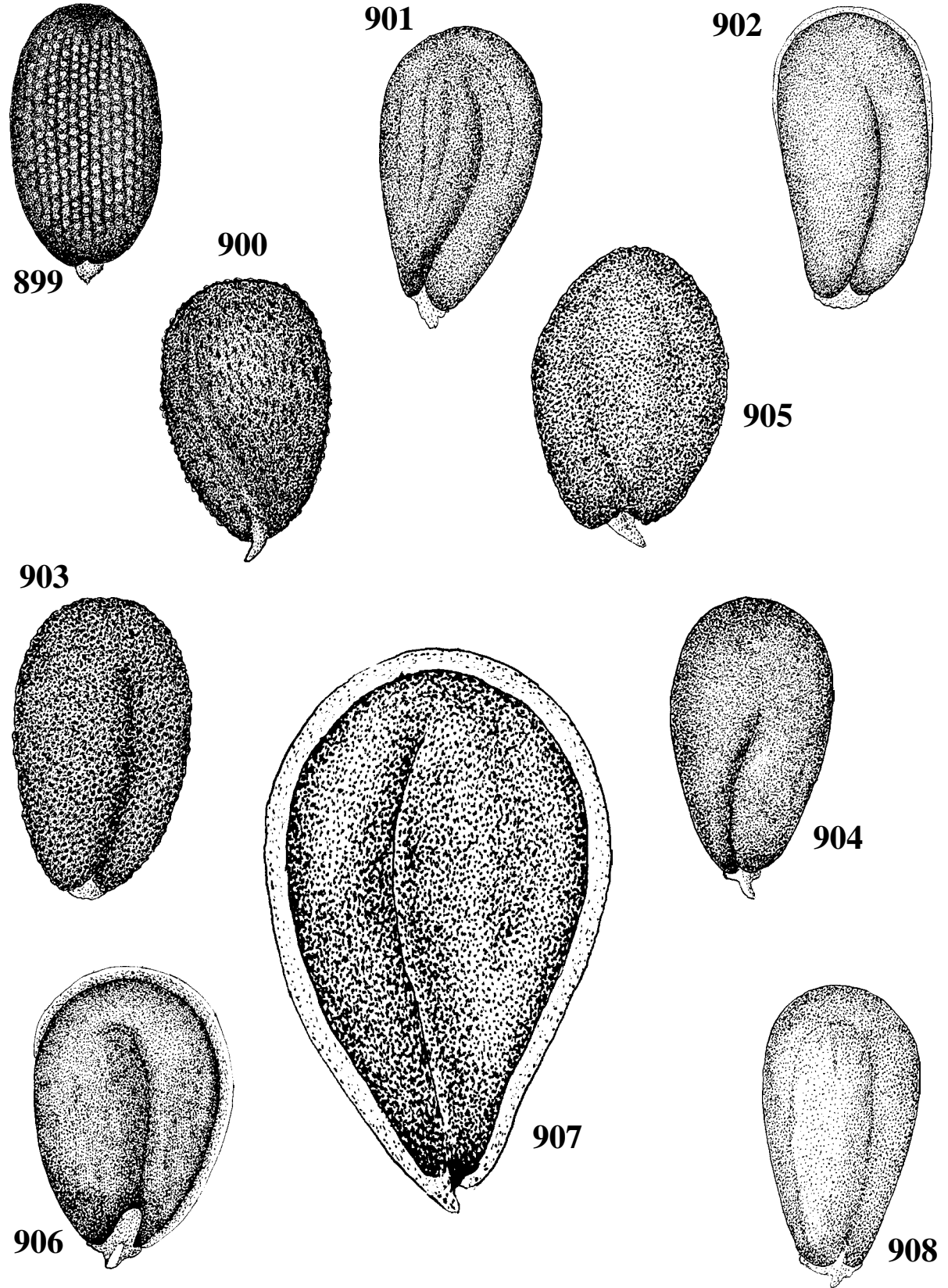
**904. *Lepidium heterophyllum* (DC.) Benth.** — Perennial, 10-50 cm high, stems ascendent, densely leafy,  $\pm$  unramified, densely hairy. **Seeds obovate or elliptic slight flattish, tips of radicle and cotyledons equal in length, radical furrow as long as 4/5 of the seed height, 1.8-2.3 x 1-1.3 mm. Surface fine papillose, red- to dark-brown. 2n = 16.** Native to southwestern Europe, in ruderal grassy places, embankments, dry, open habitats; rarely hauling into the Carpathians on raily-bank.

**905. *Lepidium latifolium* L.** — Perennial, stems erect, 50-100 cm high, glabrous, much leafy, much branched above. **Seeds elliptic or elliptic-oblong, lateral view elliptic, side faces slanted, radicular furrow distinct, 0.9-1.2 x 0.7-0.9 mm. Surface bare lustrous, faint papillose, henna. 2n = 24.** Originally growing in Eurasia, except the north, in saline soils; in the past cultivated as a medical plant. Hu, Mo, Pl, Ro, Sk, Uk.

**906. *Lepidium neglectum* Thell.** — Annual or biennial, up to 15-25 cm high, stems erect, papillose, ramified only in upper part, densely leafy. **Seeds semiobovate, narrowly winged along the radicular margin, 1.5-1.7 x 1-1.2 mm. Surface faint papillose red-brown, wing brownish.** Native to North and Central America, introduced and naturalized in the Carpathians, on waste ground embankments, roads, railways, PL, Ro, Sk.

**907. *Lepidium perforatum* L.** — Annual or biennial, up to 20-40 cm high, stems single, erect, sparsely hairy, densely leafy,  $\pm$  ramified. **Seeds obovate, apex rounded, base subacute, radicle and cotyledons margin winged, 1.7-2.1 x 1.1-1.5 mm. Surface velvety-like, faint papillose, dark- to black-brown, wing pale-brown. 2n = 16.** Originally growing in central, eastern and southeastern Europe; in the whole Carpathians, on waste grounds, embankments, fallow fields, in warmer areas.

**908. *Lepidium rudemale* L.** — Annual or biennial, up to 10-30 cm high, stems erect or ascending, sparsely hirsute, seldom glabrous, branched in the upper part,



more or less foetid. Seeds obovate or semiobovate, flattish, lateral view elliptic, cotyledonary part 1.5-2 times as wide as the radicular one, 1-1.5 x 0.6-0.8 mm. Surface barely lustrous, faint papillose, orange-brown.  $2n = 32$ . An Euro-Siberian plant, native to waste places, roadsides, saline soils; in warmer areas of the whole Carpathians.

**909. *Lepidium sativum* L.** — Annual, glabrous, stems single, erect, 20-40 cm high, often glaucous, sparsely leafy. Seeds elliptic, obovate or semiobovate, tips of radicle and cotyledons equal in length, radicular furrow distinct, 2.5-3 x 1.4-1.6 mm. Surface slight uneven undulated with very small irregular elevations, orange-brown.  $2n = 16, 24$ . Native to tropical Africa, cultivated as a salad plant, and naturalized in Europe, in fields as weed. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**910. *Lepidium virginicum* L.** — Annual or biennial, up to 30-50 cm high, stems erect, single, usually branched above,  $\pm$  hairy. Seeds semiobovate, lateral view compressed, apex rounded, base tapered, winged along the radicular margin, 1.5-1.8 x 1.1-1.3 mm. Surface bare lustrous, fine sparse papillose, brown, wing yellowish.  $2n = 32$ . Originally growing in North America, introduced and naturalized in Europe, on embankments, roads, waste grounds, in gardens. Hu, Pl, Ro, Sk.

**911. *Cardaria draba* (L.) Desv., *Lepidium draba* L.** — Perennial, glabrous to pubescent, stems 20-90 cm high, erect, angular, densely leafy, ramified in the upper part. Seeds obovate or elliptic-obovate, lateral view slight compressed, tips of radicle and cotyledons usually appressed together, radicular furrow indistinct on both faces, 1.8-2.2 x 1.2-1.5 mm. Surface velvet-like, indistinct reticulate, dark-brown.  $2n = 64$ . Native to Asia, now throughout the Carpathians, as weed of fields, wastes and roadsides.

**912. *Coronopus didymus* (L.) Sm., *Lepidium didymum* L.** — Annual or biennial, 10-40 cm high, stems ramified, procumbent or ascending, stinking when crushed. Seeds elliptic, flattish, with a large oval and deep hilum, 1.1-1.5 x 1.3-1.7 mm. Surface lustreless, coarse humpy, dirty-yellowish.  $2n = 32$ . Probable place of origin South America, secondary cosmopolitan, ruderal, as weed in gardens, roads, free rural places. Pl, Ro, Sk.

**913. *Coronopus squamatus* (Forsk.) Asch., *C. procumbens* Gilib.** — Annual or biennial, stems 5-30 cm high, ramified, procumbent, leafy. Fruits silicles, reni-

form, flattish fused, strongly reticulate with dentate edge, 2.8-3.2 x 3.7-4.3 mm. Seeds semiobovate, tip of radicle longer than that of the cotyledons, 2-2.4 x 1.2-1.5 mm. Surface glabrous, fine reticulate, light orange-yellow.  $2n = 32$ . Native to the Mediterranean, as ruderal now in all warmer areas of Europe, on roads, ditches, pastures, damp grounds. Hu, Mo, Pl, Ro, Sk, Uk.

**914. *Biscutella laevigata* L.** — Perennial, up to 10-70 cm high, stems erect, simple or ramified, little leafy. Seeds scale-shaped, flattish, distinct margined with 1-mm broad edge, 3.2-3.6 x 2.2-2.6 mm. Surface faint and scarce reticulate, slight lustrous, yellowish-brown.  $2n = 18, 36$ . Mainly in mountains of central and southern Europe, on rocky and stony grounds, in the subalpine zone. Hu, Pl, Ro, Sk, Uk.

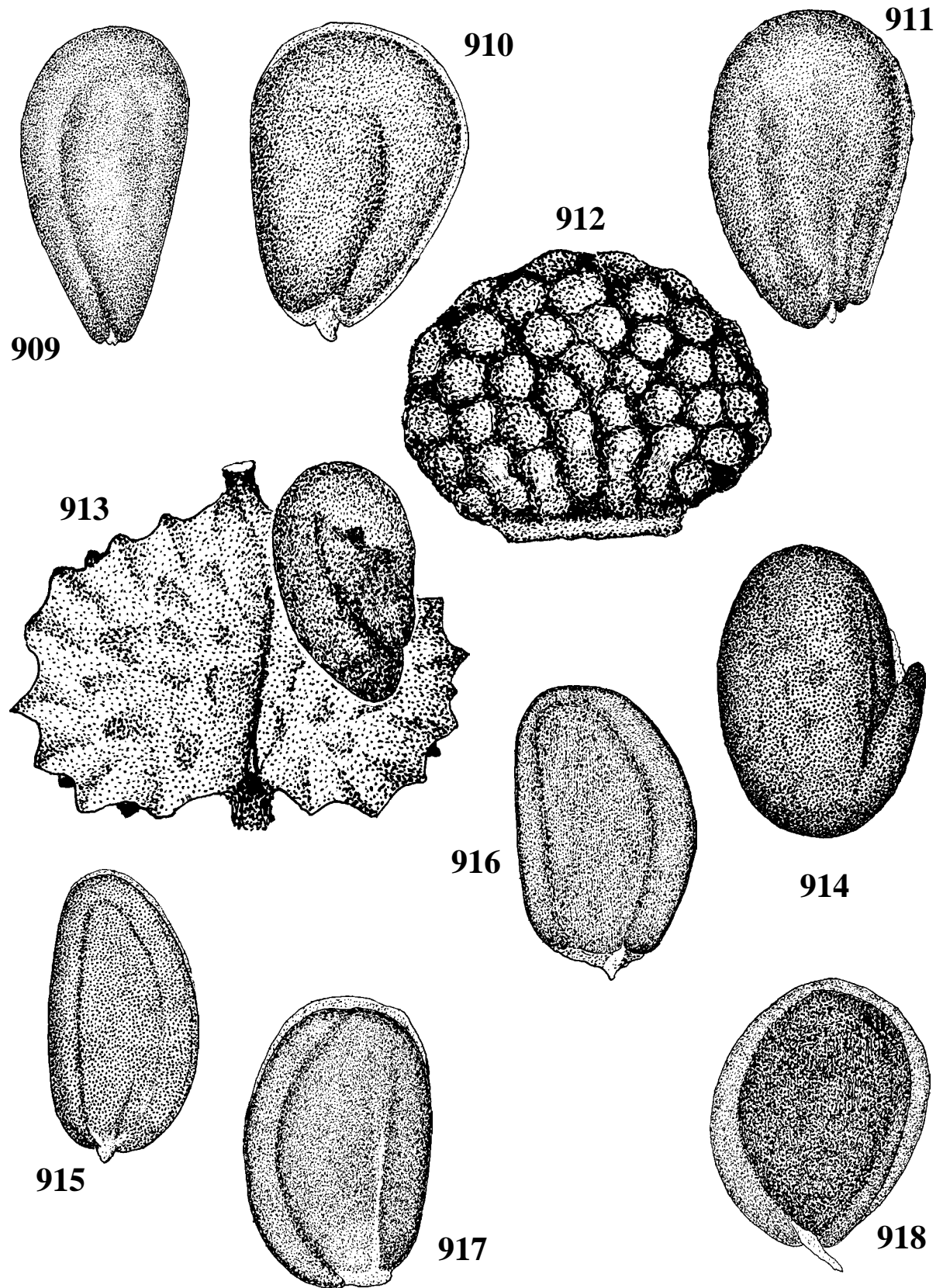
**915. *Iberis amara* L.** — Annual, up to 10-40 cm high, stems erect, hairy below, corymbosely ramified. Seeds elliptic or ovate, flattish, with or without narrow wings at the apex, radicle and cotyledons of the same thickness and distinct united furrows, 3.8-4.5 x 1.8-2.4 mm. Surface glabrous, lustreless, dark-brown.  $2n = 14$ . Native to the western Mediterranean territory; cultivated in flowerpots and gardens as an ornamental plant, and naturalized in warmer, calcareous soils. Hu, Mo, Pl, Ro, Sk, Uk.

**916. *Iberis pinnata* L.** — Annual or biennial, up to 10-25 cm high, erect, stem solitary ramified, sparsely pubescent, corymbose above. Seeds elliptic or ovate, flattish, with a thin lateral suture, without narrow wing at the apex, 3-3.3 x 2-2.4 mm. Surface faint wrinkly, slight lustrous, orange-brown. Native to southern Europe and Asia Minor, in mountains on chalky slopes; cultivated in flowerpots and rock-gardens as an ornamental plant. Ro, Sk, Uk.

**917. *Iberis saxatilis* Torn.** — Perennial, caespitose, stems 5-10 cm high, richly and densely ramified from the base, leaves linear, leathery. Seeds ellipsoid, lateral compressed, with narrow wing at the apex, radicle as long as cotyledons, 3.4-4 x 2.2-2.7 mm. Surface fine reticulate-areolate, faint lustrous, brown. Native to southeastern Europe, on calcareous stands, in rocky splits; also cultivated in rock-gardens or flowerpots. Ro, Uk.

**918. *Iberis semperflorens* L.** — Shrub, evergreen, whole stem woody, ramified above, with herbaceous flowering, erect or procumbent branches up to 80 cm





high. **Seeds elliptic or circular with a broad wing all around the seed, cotyledons part 5-8 times broader than the radicle, 3.2-3.8 x 2.1-2.5 mm. Surface lustreless, faint wrinkled, cinnamon-brown, wing yellowish. 2n = 22, 44.** Native to southern Europe and northern Africa, rock-crevices on maritime cliffs, cultivated in gardens, often in full-blossom varieties. Hu, Ro, Sk.

**919. *Iberis sempervirens* L.** — Perennial, evergreen, 20-30 cm high, stems woody, procumbent, ramified, glabrous, with herbaceous, flexuous, lateral scales 10-15 mm long. **Seeds elliptic or obovate, without wing or with some rest of wing, 3.2-3.6 x 2.2-2.6 mm. Surface fine wrinkly, brown or dark-brown. 2n = 22, 44.** Originally growing in southern Europe, in rock-crevices of high mountains; in the Carpathians in gardens and rock-gardens, cultivated as an ornamental in full-blossom cvs, occasionally naturalized. Hu, Ro, Sk.

**920. *Iberis umbellata* L.** — Annual or biennial, up to 20-50 cm high, stem erect, ramified in the upper part, leafy. **Seeds elliptic, flattish, without wing or with some rest of it, similar to *I. amara* and *I. pinnata*, 3-3.6 x 2.1-2.3 mm. Surface faint reticulate, dark-brown. 2n = 14, 16, 18.** Native to southern Europe on rocks and in calcareous places; often cultivated as a summer plant in flowerpots and flower-beds in some cvs. Hu, Mo, Pl, Ro, Sk, Uk.

**921. *Fibigia clypeata* (L.) Medik.** — Perennial, stems 30-80 cm high, greyish-green, densely stellately pubescent. **Seeds ellipsoid, strong compressed lateral, broad winged around, 5-6 x 4.4-5 mm. Surface fine colliculate, lustrous, dark-brown, membranous wing yellowish.** Native to the Crimea, on stony and dry slopes, in subalpine and alpine zones; rarely cultivated in gardens as a decorative plant. Uk.

**922. *Aethionema arabicum* (L.) Andr. ex O. E. Schulz, *A. buxbaumii* (Fischer ex Hornem.) DC.** — Annual, stems slender, simple or branched, about 10 cm high. **Seeds prolonged obovoid, lateral slight compressed, apex rounded, bottom gradually narrowed, 1.5-1.7 x 0.7-0.9 mm. Surface tuberculate, glossy, orange-brown.** Native to southeastern Asia; uniquely and transiently hauling into dry places of the Carpathians.

**923. *Aethionema grandiflora* Boiss et Hohen.** — Perennial, stem 15-20 cm high, erect, a glaucous plant with nice pink flowers. **Seeds obovoid, lateral**

**compressed, apex roundish, bottom gradually narrowed, 2.3-2.7 x 1-1.2 mm. Surface longitudinal grooved, faint lustrous, brown.** Native to the mountains of Persia (Elbrus), on sunny calcareous slopes, frost-resistant; in the Carpathians often cultivated mostly in rock-gardens.

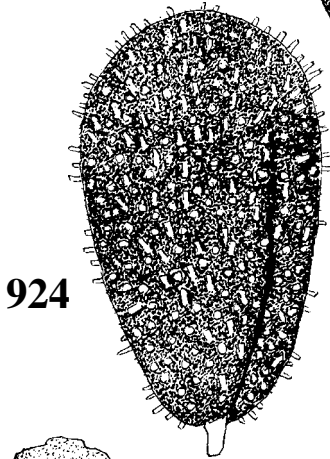
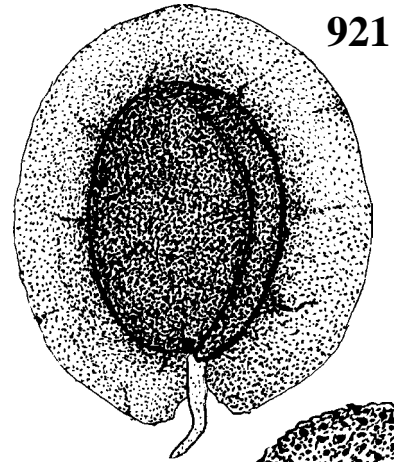
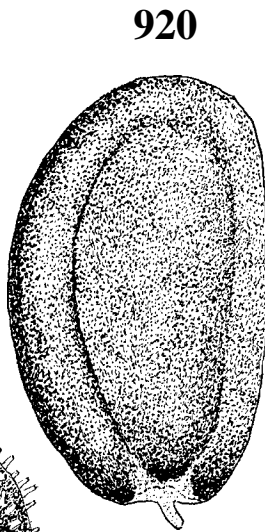
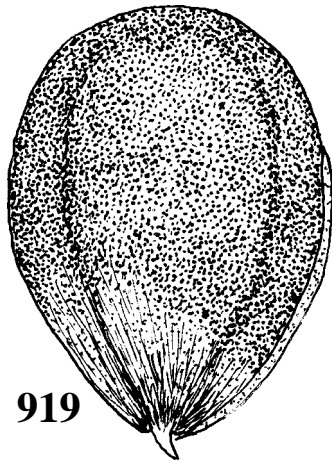
**924. *Aethionema saxatile* (L.) R. Br., *Thlaspi saxatile* L.** — Annual or perennial, often woody at the base, 5-30 cm high, stems ascending or erect, seldom ramified, glabrous. **Seeds obovate, tips of the radicle and cotyledons equal in length, radicular furrow distinct, 1.4-1.6 x 0.8-1 mm. Surface faint reticulate, papillose, yellowish-brown. 2n = 48.** Native to the mountain slopes of the southern and central Europe, on screes with calcareous soils; rarely in uplands of the Carpathians. Hu, Ro, Sk.

**925. *Pritzelago alpina* (L.) Kuntze, *Hutchinsia alpina* (L.) R. Br.** — Perennial, 5-10 cm high, stems erect or ascendent, seldom ramified, sparsely hirsute above. **Seeds elliptic, flattish, tip of the radicle and cotyledons equal in length and thickness, 1.6-2 x 0.8-1 mm. Surface glabrous, light-brown or brown. 2n = 12.** Native to the mountains of central and southern Europe, on moist screes, rock-crevices, alpine pastures; seldom cultivated in rock-gardens. Pl, Ro, Sk.

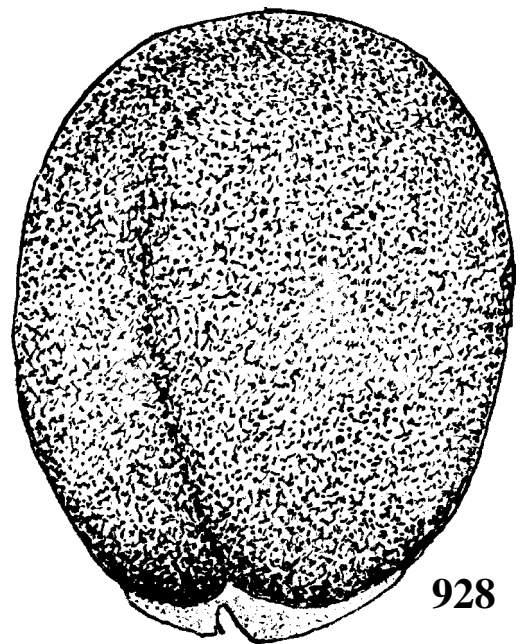
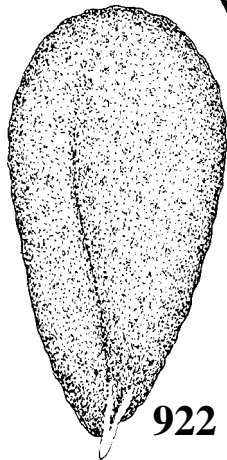
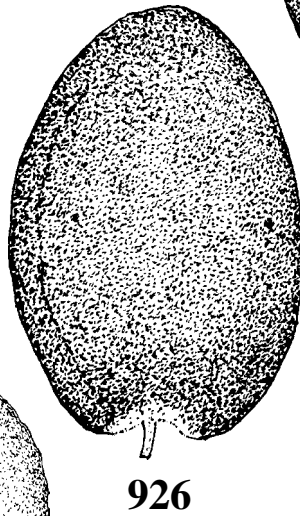
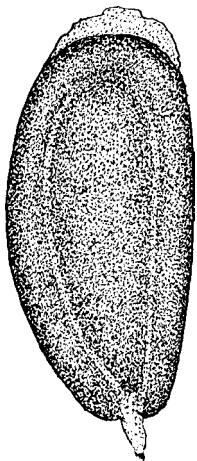
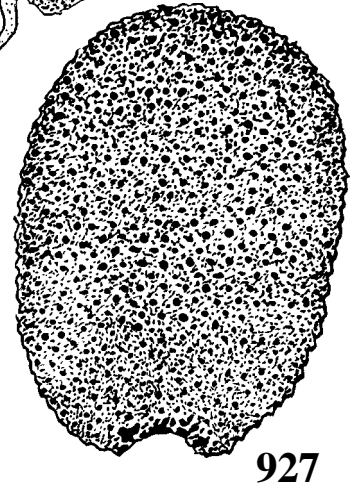
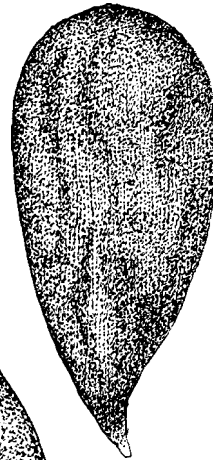
**926. *Hornungia petraea* (L.) Rchb., *Hutchinsia petraea* (L.) R. Br.** — Annual, 2-15 cm high, stems slender, ascendent, ramified. **Seeds elliptic-ovate, sometimes excentric, slight flattish, radicular furrow rather distinct, 0.7-0.9 x 0.4-0.6 mm. Surface lustreless to barely lustrous, sparse papillary, orange to orange-brown. 2n = 12.** Native to southwestern and central Europe, on sunny stony slopes, lime and dolomite substrate; in the Carpathians rare. Au, Hu, Ro, Sk, Uk.

**927. *Hornungia procumbens* (L.) Hayek, *Hymenolobus procumbens* Nutt. ex Torr. et Gray** — Annual, stems simple or branched at base, 5-20 cm high, ascending or erect, glabrous or sparsely pubescent. **Seeds oval, lateral compressed, 0.6-0.8 x 0.45-0.55 mm. Surface low-granulate, lustrous, yellowish-brown. 2n = 12, 24.** Native to southeastern Europe; sandy and stony saline stands. Mo, Ro, Uk.

**928. *Teesdalia nudicaulis* (L.) R. Br., *Iberis nudicaulis* L.** — Annual, up to 10-40 cm high, leaves in a ground rosette, stems erect, glabrous, without leaves. **Seeds circular or obovate, flattish,**



923



cotyledonary part 2-3x as wide as the radicular one, hilum with whitish callus, 0.9-1.2 x 0.8-1.1 mm. Surface glabrous, lustreless, fine areolate, brown to dark-brown.  $2n = 36$ . Native to western and central Europe, rarely in sandy, dry places, steppes, gravelly river terraces, in cornfields, calcifugous. Br, Hu, Pl, Ro, Sk, Uk.

**929. *Thlaspi alliaceum* L.** — Annual, up to 20-60 cm high, stems simple, grooved, erect, white hirsute at the bottom. **Seeds obovate, elliptic, slight flattish, radicle with indistinct furrow, 1.6-2 x 1-1.3 mm. Surface alveolate, reddish-brown, as a rule with one or two yellowish spots, rarely the seeds are purely yellow or reddish-brown.  $2n = 14$ .** Native to western and central Mediterranean, as well as south-eastern Europe, as weed of arable lands and waste places. Hu, Pl, Ro, Sk, Uk.

**930. *Thlaspi arvense* L.** — Annual to biennial, up to 10-50 cm high, stems erect, simple or ramified, glabrous, foetid. **Seeds elliptic or obovate, flattish, tips of radicle and cotyledons equal in length, 1.7-2 x 1.3-1.5 mm. Surface with 5-7 distinct, parallel ribs and furrows, black-brown to black.  $2n = 14$ .** Originally growing in Eurasia, as weed of cultivated and waste grounds, roadsides, human dwellings; throughout the Carpathians.

**931. *Thlaspi caerulescens* J. et C. Presl, *T. alpestre* auct. non L.** — Biennial or perennial, 15-50 cm high, glabrous, ground leaves in a rosette. **Seeds elliptic, lateral view compressed, tip of a radicle slight shorter than that of the cotyledons, hilum with a slight callus, 1.3-1.6 x 0.8-1 mm. Surface lustreless or faint lustrous, fine granulate, orange-brown.  $2n = 14$ .** Native to the upland regions of southwestern and central Europe, on pastures, grassy or shrubby slopes, dryer meadows. Hu, Pl, Sk.

**932. *Thlaspi dadicum* Heuff., *T. alpestre* Baumg.** — Perennial, 5-35 cm high, stem glabrous, single, with a leafy rosette at base, erect. **Seeds semielliptic, flattish, margin winged or not, cotyledons manifold broader than the radicle, large variability in size, shape and thickness, 1.6-2 x 1-1.2 mm. Surface smooth, slight wrinkly and waved, dark-brown.** Endemic to the Carpathians in subalpine and alpine zones, on stony slopes. Pl, Ro, Uk.

**933. *Thlaspi jankae* A. Kern, *T. avalanum* auct. non Pančić** — Annual or perennial, stems 15-50 cm high, erect, unramified, densely leafy. **Seeds elliptic, slight**

**flattish, tip of the radicle shorter than that of the cotyledons, 1.3-1.6 x 0.8-1 mm. Surface indistinct parallel-furrowed and waved, faint lustrous, dark-brown.  $2n = 28$ .** Endemic to the Carpathians; in forest communities, on calcareous grounds. Hu, Ro, Sk, Uk.

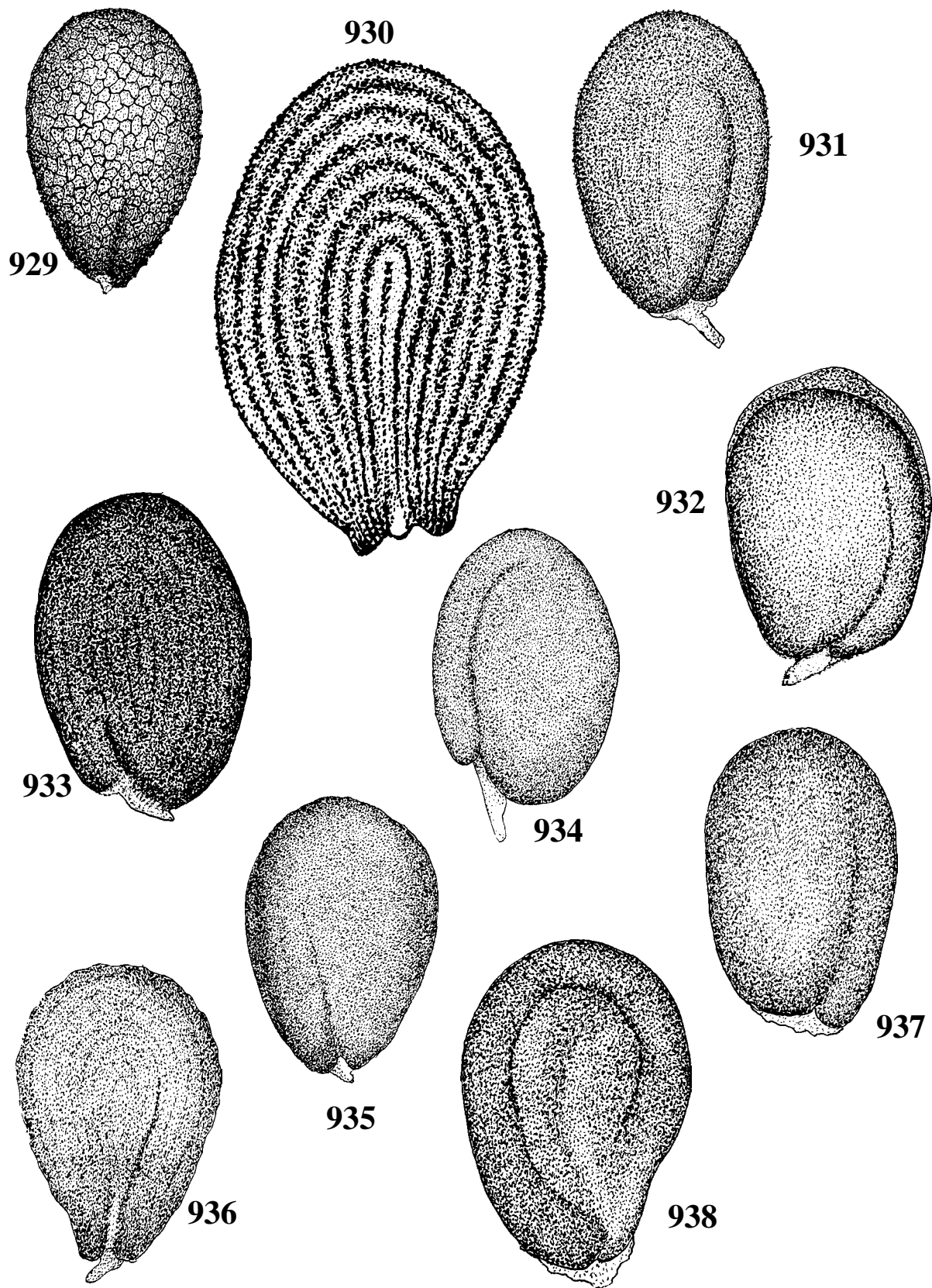
**934. *Thlaspi montanum* L.** — Perennial, up to 10-20 cm, stems erect, mat-forming, the branches of the stem usually elongated. **Seeds elliptic, flattish, tip of the radicle much shorter than that of the cotyledons, 1.6-2 x 1.2-1.4 mm. Surface smooth, faint waved, dull, yellowish- to dark-brown.  $2n = 28$ .** Native to central Europe, on rocky slopes, cliff-edges, screes and open grassland, mainly on limestone. Hu, Sk.

**935. *Thlaspi perfoliatum* L.** — Annual or biennial, up to 10-30 cm high, stems erect, seldom ramified, hoary, glabrous, glaucous. **Seeds obovate, usually excentric, slight flattish, radical furrow slight expressive, 1.2-1.6 x 0.8-1.1 mm. Surface barely lustrous, smooth to fine papillose, orange-brown.  $2n = 42$ .** Native to the Mediterranean, weed of fields, vineyards, roadsides, in calcareous soils; throughout the Carpathians.

**936. *Thlaspi praecox* Wulf.** — Perennial, stems 10-30 cm high, stem leaves shallowly dentate. **Seeds obovoid, slight lateral compressed, apex rounded, bottom narrowed, radicle as long as the cotyledons, 1.3-1.6 x 0.9-1 mm. Surface shallow furrowed, faint lustrous, reddish-brown.** Native to Eurasia, on steppes, stones, slopes, poor meadows. Mo, Ro, Uk.

**937. *Hymenolobus procumbens* (L.) Desv., *Lepidium procumbens* L.** — Annual or biennial, up to 5-30 cm high, stem single, ramified below, procumbent, ascendent or erect, dispersely pubescent. **Seeds elliptic, lateral view slight compressed, hilum with a small whitish callus, 0.6-0.7 x 0.4-0.5 mm. Surface glabrous, faint reticulate, slight lustrous, yellowish.  $2n = 12, 24$ .** Mainly in the southern Europe, frequently on maritime coasts and saline habitats. Mo, Ro, Uk.

**938. *Subularia aquatica* L.** — Annual, minute, glabrous, scapigerous, water-coastal plant with narrow awl-shaped leaves, 2-8 cm high. **Seeds obovate, margin obtuse, tip of radicle blunt, tip of cotyledons rounded, testa subtranslucent, 0.9-1.2 x 0.6-0.8 mm. Surface glabrous, barely lustrous, fine papillose, yellowish-brown.  $2n = c. 36$ .** Native to



Euro-Siberia and North America, in shallow waters, riverbanks, pools and lakes. Br, Uk.

**939. *Cochlearia anglica* L.** — Biennial to perennial, robust, up to 40 cm high. **Seeds obovoid, compressed, apex roundish, bottom gradually narrowed, radicle as long as broader cotyledons, 1.8-2.1 x 1.3-1.5 mm. Surface tuberculate, warts arranged in concentric rows, lustreless, purple-brown. 2n = 48, 54.** Native to northern-western Europe, on muddy shores, estuaries, saline meadows, sea margins. Pl.

**940. *Cochlearia officinalis* L.** — Biennial, green in winter, 20-40 cm high, stems ascendent,  $\pm$  unramified, angular, leafy. **Seeds elliptic, transverse section elliptic, margin rounded, tip of the radicle longer than that of the cotyledons, elliptic incurved, 1.3-1.8 x 1-1.3 mm. Surface verrucose or papillose forming a network, reddish-brown. 2n = 24.** Native to the European coast of the Atlantic Ocean and inland on saline soil; cultivated as medical plant in the past. Pl, Ro, Sk.

**941. *Cochlearia polonica* Fröhlich** — Biennial, stems 15-50 cm high, basal leaf reniform or ovate-cordate. **Seeds semiellipsoid or obovoid, lateral compressed, radicle as long as the broader cotyledons, 1.5-2 x 1.3-1.5 mm. Surface tuberculate in concentric rows, lustreless, dark-brown. 2n = 36.** Native to Europe, on damp sands along lowland streams. Pl, Uk.

**942. *Cochlearia pyrenaica* DC., *C. borzeana* (Com. et Nyár.) Pobed.** — Biennial to perennial, stems erect or ascendent, 15-40 cm high, branched or simple. **Seeds elliptic or subrounded, slight compressed, radicle longer than the cotyledons, 1.5-1.8 x 1.1-1.3 mm. Surface verrucose, reddish-brown. 2n = 14, 24.** Native to the Northern Hemisphere, on calcareous turfs of mountains, wet flushes and along streams. Pl, Ro.

**943. *Cochlearia tatrae* Borbás** — Perennial, glabrous, 10-30 cm high, stems erect or ascendent,  $\pm$  unramified, angular, leafy. **Seeds elliptic or obovate, flattish tip of the radicle longer than that of the cotyledons, 1.4-1.8 x 1.2-1.4 mm. Surface faint verrucose, pale- or dark-brown. 2n = 42.** Endemic to the Carpathians, in granite mountains, gravelly silts, river heads. Pl, Sk.

**944. *Kernera saxatilis* (L.) Sweet, *Myagrum saxatile* L.** — Perennial, stems erect, sometimes branched on top, 10-40 cm, with a basal leaves

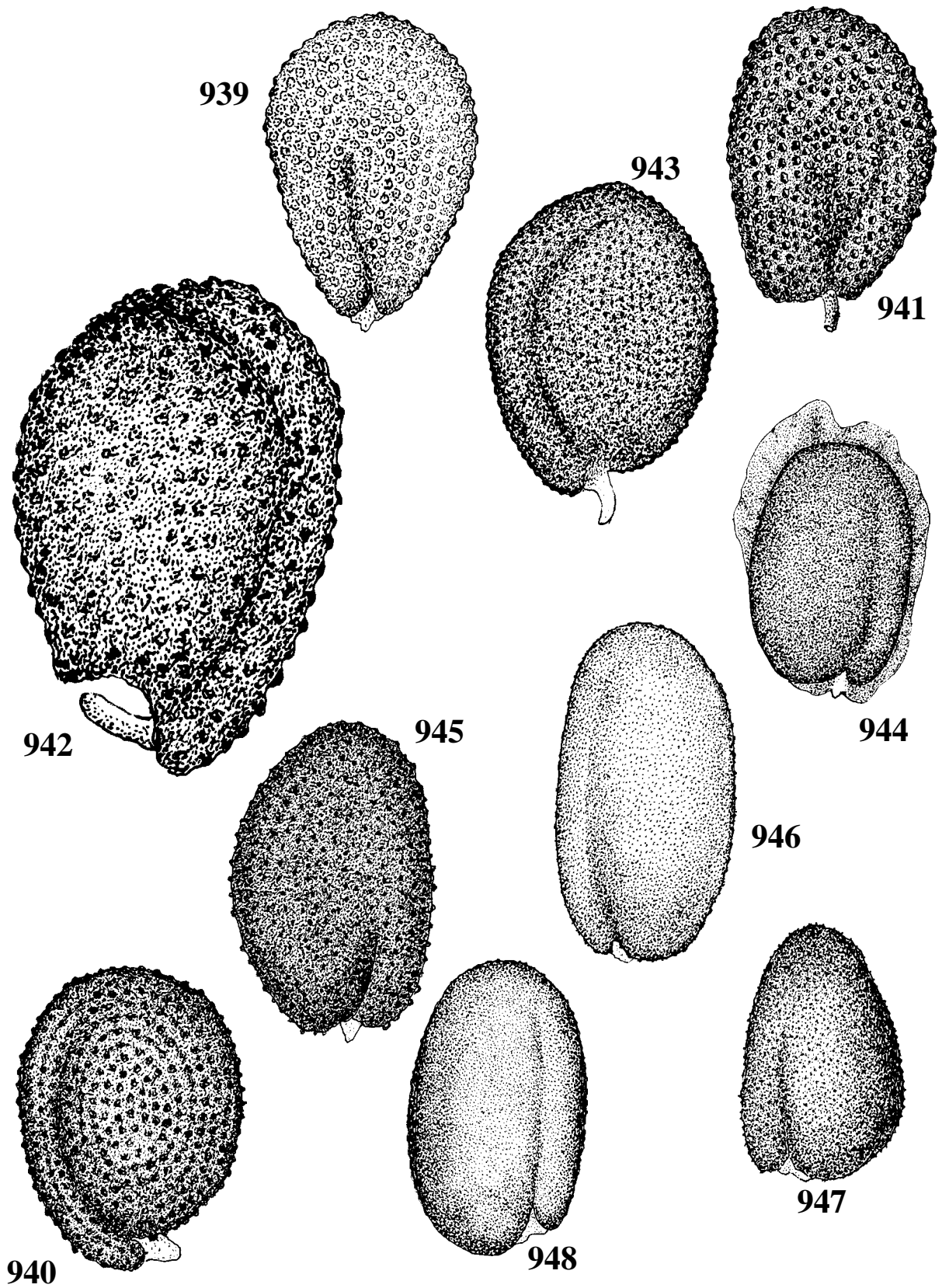
rosette. **Seeds very irregular, mostly prolonged, angular, flattish, margin often winged along the whole circumference, or one side of the seed, 1-1.4 x 0.7-0.8 mm. Surface glabrous, dark-brown. 2n = 14.** Native to the mountains of southern and central Europe, on calcareous rocks and screes; in the Carpathians var. *auriculata* (Lam.) Coste. Pl, Ro, Sk.

**945. *Ionopsidium acaule* (Desf.) Rchb.** — Annual, stemless or sometimes with a short stem, basal leaves (1-3) stalked, ovate, up to spherical. **Seeds obovoid or ellipsoid lateral slight compressed, radicle equal or a little longer than the cotyledons, 1.1-1.3 x 0.7-0.9 mm. Surface papillary tuberculate, lustreless, pale- or dark-brown. 2n = 24.** Originally growing in Portugal; in the Carpathians widely cultivated in rock-gardens for ornament, rarely naturalized.

**946. *Camelina alyssum* (Mill.) Thell., *C. linicola* Schimp. et Spenn.** — Annual, stems 30-70 cm, erect, sparingly branched, subglabrous. **Seeds elliptic, often irregular, radicle equal to the cotyledons, radical furrow distinct, about 5/6 of the seed height, 1.8-2.5 x 0.9-1.2 mm. Surface papillose, faint lustrous, orange-brown. 2n = 40.** Native to Eurasia, widespread in mountains, weed of flax-fields. Br, Hu, Pl, Ro, Sk, Uk.

**947. *Camelina microcarpa* Anarz.** — Annual, densely hairy below, stem 20-60 cm, simple or branched. **Seeds irregularly obovate, ovate, elliptic, transverse section triangular or ovate, radicle slight shorter or equal to the cotyledons, 1.2-1.6 x 0.6-0.8 mm. Surface alveolate and papillose, lustreless, dark reddish-brown. 2n = 40.** Native to eastern Europe and western Asia, as weed in cornfields, feeders, waste-places in warmer areas; throughout the Carpathians, mostly as a causal plant in warmer areas.

**948. *Camelina sativa* (L.) Crantz subsp. *sativa*, *C. glabrata* (DC.) Fritsch** — Annual, stems 30-100 cm, simple or sparingly ramified, leafy at the bottom, glabrous or sparsely hirsute. **Seeds elliptic, slight flattish, transverse section irregular triangular, radicle slight, shorter or equal to the cotyledons, 1.8-2.2 x 1-1.2 mm. Surface papillose, dark-brown. 2n = 40.** For a long time cultivated as an oil-yielding plant. Hu, Mo, Pl, Ro, Sk, Uk.





**949. *Camelina sativa* subsp. *pilosa* DC., *C. sylvestris* Wallr. subsp. *pilosa* (DC.) Zing., *C. microcarpa* Andr. subsp. *pilosa* (DC.) Hüt.** – Annual, stems and leaves scattered hairy below, the hairs stelliform and forkedly branched. **Seeds ovoid, slight compressed, radicle a little longer than the cotyledons, 1.3-1.6 x 0.8-1 mm. Surface dense granulate, faint lustrous, reddish-brown.** Native to Eurasia, formerly rarely cultivated in the Carpathians, now occurring only as a weed in fields and disturbed grounds. Br, Mo, Uk.

**950. *Neslia paniculata* (L.) Desv., *Vogelia paniculata* (L.) Hornem.** – Annual, stems erect, sometimes branched on the top, pubescent, densely leafy below, 5-80 cm high, from star-shaped hairs downy. **Seeds circular or elliptic, apex with small beak, more or less rounded or truncate, 1.6-1.8 x 1.8-2.4 mm. Surface alveolate, lustreless, grey or greyish-brown. 2n = 14.** Originally growing in Europe and western Asia, weed of cultivated grounds, mostly in winter cereals, road verges; in the whole Carpathians.

**951. *Capsella bursa-pastoris* (L.) Medik., *Thlaspi bursa-pastoris* L.** – Annual or biennial, stems simple, seldom branched, 20-50 cm high, finely sulcate, sparsely hirsute only at the bottom. **Seeds elliptic-oblong, lateral view flattish, slight biconvex, apex rounded, radicle equal the cotyledons, 0.8-1.2 x 0.4-0.6 mm. Surface bare, lustrous, reticulate-scalariform, dull, orange-yellow. 2n = 32.** Circumpolar, secondary cosmopolitan, a weed of fallow fields, roadsides and waste places; as a ruderal in all countries of the Carpathian region.

**952. *Capsella rubella* Reuter** – Annual, plant sparsely hairy or glabrous, stems usually numerous, ascendent from base. **Seeds elliptic-oblong, very similar to *C. bursa-pastoris*, 0.8-1 x 0.5-0.7 mm. Surface fine papillary, pale orange-yellow. 2n = 16.** Native to southern Europe, naturalized in the Carpathians, in waste places, cultivated lands in lowlands, rare. Hu, Ro, Uk.

**953. *Aurinia petraea* Schur., *Alyssum petraeum* Ard.** – Biennial to perennial, up to 25-50 cm high, numerous stems branched above. **Seeds spherical or ellipsoid, compressed, whole circumference hemmed, radicle as long as the cotyledons, hilum with a prolonged raphe, 2.4-2.9 x 2.2-2.6 mm. Surface reticulate-foveolate, slight lustrous, dark-brown.** Native to southern Europe, on sunny, calcareous, rocky slopes. Ro.

**954. *Aurinia saxatilis* (L.) Desv., *Alyssum saxatile* L., *A. arduini* Fritsch** – Perennial, stems 15-40 cm high, ascendent, ramified, often woody at the base. **Seeds circular-obovate with broad membranous wings, 2.4-2.9 x 2.2-2.6 mm. Surface glabrous, reddish-brown. 2n = 16.** Native in to central Europe and the Balkan countries, on dry limestone rocks, southern slopes, river valleys, in lowlands and uplands, in same cvs cultivated as ornamental in gardens. Hu, Mo, Ro, Sk, Uk.

**955. *Berteroa incana* (L.) DC., *Camelina incana* (L.) J. et C. Presl** – Annual or perennial, up to 30-70 cm high, stems erect, stellately hairy, mostly ramified, leafy. **Seeds subcircular, elliptic, often excentric, flattish, margin surrounded with coriaceous border, radicle as long as the cotyledons, 1.6-1.8 x 1.4-1.6 mm. Surface waved, faint lustrous, dark-brown. 2n = 16.** Native to central and eastern Europe and western Asia, on dry, sunny, stony, sandy places, pastures, fields; in all countries of the Carpathian region.

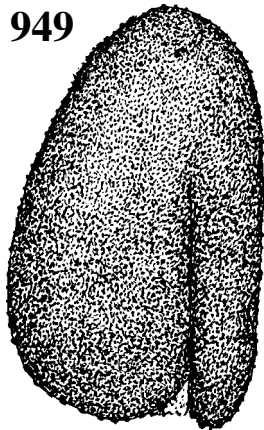
**956. *Lobularia maritima* (L.) Desv., *Alyssum maritimum* (L.) Lam.** – Perennial, stems 10-40 cm high, puberulent or hairless, erect or ascendent, ramified. **Seeds elliptic, flattish, tip of the radicle narrowed, as long as cotyledons, hilum with a callus, most part of the circumference winged, 1.3-1.7 x 0.9-1.1 mm. Surface glabrous, pale-brown to brown. 2n = 24.** Native to the Mediterranean, on sea coasts, stony slopes, dry sunny places; widely cultivated in gardens as an ornamental, especially cv. 'variegatum' with yellowish and white-spotted leaves (*Alyssum odoratum* hort.).

**957. *Erophila verna* (L.) Chevall., *Draba verna* L.** – Annual, up to 3-20 cm high, stems erect or ascendent, ramified, basal leaves in a rosette. **Seeds elliptic or obovate, apex rounded, tip of radicle obtuse, as long as cotyledons, hilum with a slight callus, 0.5-0.6 x 0.3-0.4 mm. Surface glabrous, slight rough, indistinct reticulate or smooth, brown. 2n = 14, 24 up to 40, 52, 64.** Native to southern Eurasia, as a weed in vegetable fields, roadsides, turfs; throughout the Carpathians.

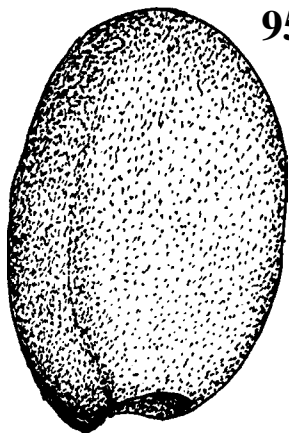
**958. *Petrocallis pyrenaica* (L.) R. Br., *Draba pyrenaica* L.** – Perennial, only 2-8 cm high, caespitose, stems branched, often pulvinate. **Seeds rounded-elliptic, flattish, radicle longer than the cotyledons, cotyledons 3-4-times broader than the**



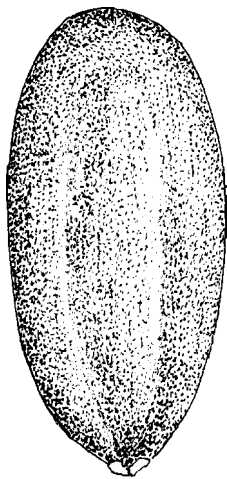
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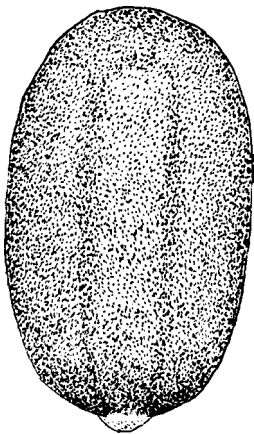
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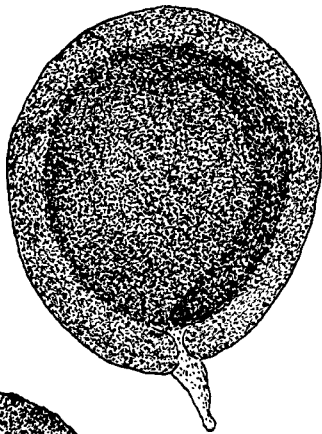
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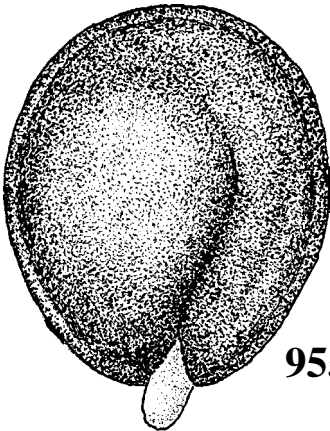
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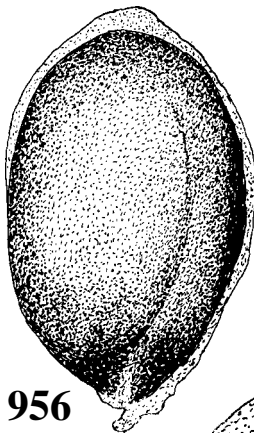
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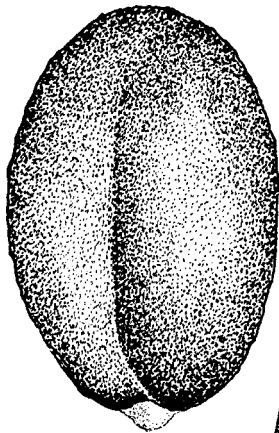
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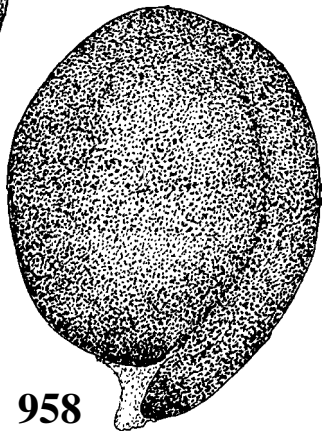
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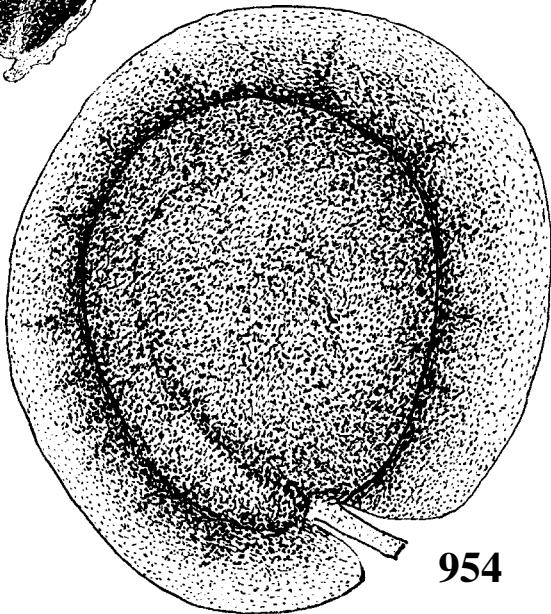
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**radicle, 1.8-2 x 1.2-1.4 mm. Surface humpy, hilum with a callus, orange-brown.  $2n = 14$ .** Native to the higher mountains of southern Europe, on calcareous rocks and screes (1700-2900 m), sometimes cultivated in rock-gardens as an ornamental. Pl, Ro, Sk.

**959. *Draba aizoides* L.** — Perennial, up to 5-10 cm high, densely caespitose, glabrous, leaves in a rosette. **Seeds ovate, flattish, with a distinct furrow, radicle usually as long as cotyledons, hilum terminated with raphe prolonged into a thread beak, 1.3-1.8 x 0.9-1.1 mm. Surface nearly glabrous, dull orange-brown.  $2n = 16$ .** Native to mountains of the Alps, on screes associated with limestone, in warm sites; in the West and East Carpathians, cultivated in gardens as nice ornamental plants.

**960. *Draba dedeana* Boiss. et Reut.** — Perennial, densely pulvinate, with a woody stock, 5-8 cm high. **Seeds obovoid, lateral compressed, radicle shorter than the cotyledons, terminated at the base with a raphe prolonged into a long thread beak, 1.4-2 x 0.9-1.1 mm. Surface faint waved, lustreless, pale-brown.** Originally growing in the Pyrenees; in the Carpathians cultivated in sunny places of rock-gardens for ornament.

**961. *Draba dorneri* Heuff., *D. stellata* Baumg.** — Perennial, up to 3-8 cm high, caespitose, woody below, flowering stem glabrous with 1-2 leaves. **Seeds ovoid or ellipsoid, flattish, radicle shorter than the cotyledons, radicle furrow distinct all around the seed, hilum with a raphe, 1-1.3 x 0.7-0.8 mm. Surface wrinkly, lustreless, brown.  $2n = 32$ .** Endemic to the South Carpathians, in rock-crevices, in the alpine zone. Ro.

**962. *Draba dubia* Suter, *D. frigida* Saut.** — Perennial, laxly caespitose, tomentose, 3-15 cm high, ramified, with a leafy rosette. **Seeds elliptic to ovate, with a small prolonged raphe at base, radicle furrow distinct, 1.1- 1.3 x 0.7-0.9 mm. Surface opaque, fine waved, lustreless, brown.  $2n = 16$ .** Originally in the mountains of Europe, on rocky slits, firm slopes, long snowy, humous soils, up to 3800 m elevation. Pl, Ro, Sk.

**963. *Draba fladnizensis* Wulfen, *D. wahlenbergii* Hartm.** — Perennial, up to 8 cm, subglabrous, caespitose, with many dense leafy rosettes. **Seeds elliptic to obovate, tip of cotyledons tapering, lateral view flattish, radicular furrow distinct, hilum with a raphe, 0.9-1.1 x 0.6-0.8 mm. Surface barely**

**lustrous, slight rough, brown.  $2n = 16$ .** An arctic-alpine plant, on rocks and rocky slits. Pl, Ro, Sk.

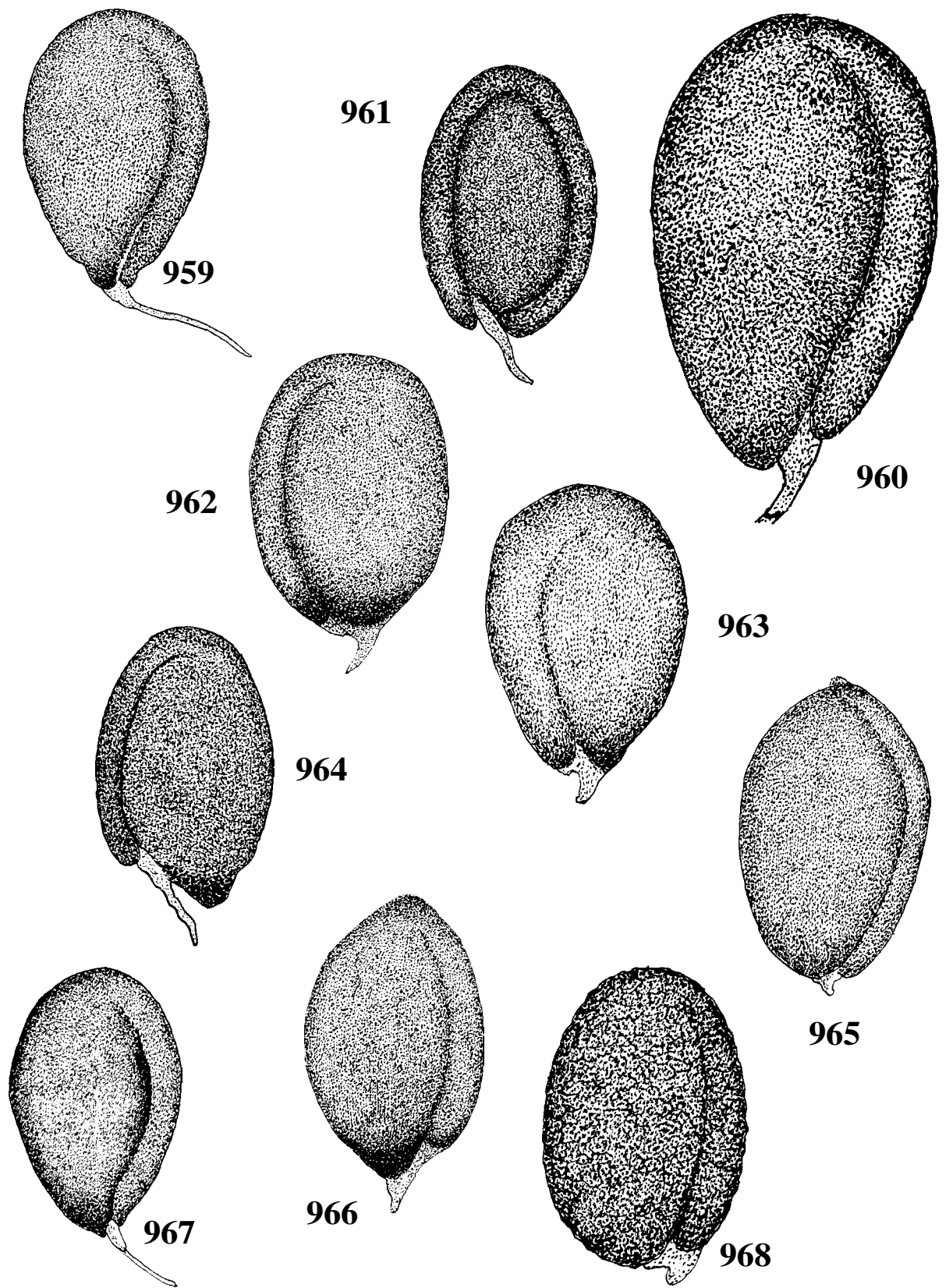
**964. *Draba haynaldii* Stur** — Perennial, caespitose, stems up to 3-8, sterile only 1-2 cm. **Seeds ovoid to elliptic, flattish, radicle shorter than cotyledons, radicular furrow distinct up to the apex, base narrowed and darker, hilum with prolonged raphe, 1.2-1.5 x 0.8-1 mm. Surface fine wrinkly, faint lustrous, orange-brown.  $2n = 16$ .** Native to the South Carpathians, on rocky and stony slopes. Ro.

**965. *Draba kotschyi* Stur, *D. androsacea* Baumg.** — Perennial, laxly caespitose, stems up to 20 cm high, lax, ascending flexuous. **Seeds ellipsoid, compressed, apex with a small beak, radicle as long as much broader cotyledons, hilum with a short raphe, 1-1.3 x 0.6-0.75 mm. Surface faint waved, lustreless, brown.** Native to the Carpathians, on rocks in the alpine zone. Ro.

**966. *Draba lasiocarpa* Rochel, *D. aizoon* Wahlenb., *D. elongata* Host** — Perennial, scapes up to 5-15 cm, densely caespitose, leaves in a rosette. **Seeds very similar to *D. aizoides*, also with raphe prolonged into a long thread beak, apex usually narrowed, radicle shorter than cotyledons, 1.2-1.5 x 0.6-0.8 mm. Surface glabrous, faint waved, dark orange-brown.  $2n = 16$ .** Native to the Balkan territories and the Carpathians, on montane calcareous rocks. Hu, Ro, Sk.

**967. *Draba loiseleurii* Boiss.** — Perennial, pulvinate, dwarf, with short, distinctly hairy scapes. **Seeds obovoid, lateral compressed, bottom with a short raphe and a long thread beak, radicle as long as much broader cotyledons, 1.3-1.5 x 0.8-0.9 mm. Surface slight waved, faint lustrous, orange-brown.  $2n = 16$ .** Native to Corsica, on mountain rocks, above 2300 m elevation; in the Carpathians rarely cultivated in rock-gardens.

**968. *Draba muralis* L., *Drabella muralis* (L.) Fourr.** — Annual or biennial, stems erect, up to 10-30 cm high, more or less stellately hairy, sometimes ramified, ground leaves in rosette. **Seeds elliptic, radicle as long as cotyledons, flattish, reticular furrow distinct, hilum raphe small, 0.7-0.9 x 0.5-0.6 mm. Surface granular waved, lustrous, orange-brown.  $2n = 32$ .** Native throughout Europe, on rocks, stony, sunny slopes, thickets, dry fields, old walls, mostly in lowlands and uplands.



**969. *Draba nemorosa* L.** — Annual, up to 30 cm high, stems erect, sometimes ramified, hirsute, ground leaves in a rosette. **Seeds elliptic, flattish, radicular furrow distinct up to 4/5 of seed, hilum with small raphe, 0.6-0.8 x 0.4-0.5 mm. Surface indistinct waved, lustrous, brown. 2n = 16.** Native to the Caucasus up to Siberia; in the Carpathians seldom cultivated in lowland and uplands as an ornamental plant, naturalized throughout the Carpathians.

**970. *Draba pacheri* Stur** — Perennial, stems up to 25 cm high, leafless or with 1-4 dentate leaves, basal leaves lanceolate, up to 2 cm, undivided or with 1-2 teeth at the margin, racemes with 10-20 flowers. **Seeds oval, radicle little longer than cotyledons, 1.2-1.4 x 0.7-0.8 mm. Surface waved, lustrous, reddish-brown.** Native to the Belianske Tatry mountains. Sk.

**971. *Draba sibirica* (Pall.) Thell., *D. reopens* M. Bieb.** — Perennial, stems long, slender, creeping, producing erect or ascending scapes with 8-20 yellow flowers. **Seeds obovoid, lateral compressed, radicle shorter than much broader cotyledons, hilum with a short raphe, 0.9-1.1 x 0.6-0.7 mm. Surface granular waved, lustrous, brown.** Native to Eurasia (Siberia, Ural, Caucasus); in the Carpathians rarely cultivated in gardens and rock-gardens.

**972. *Draba siliquosa* M. Bieb., *D. carinthiaca* Hoppe** — Perennial, up to 5-15 cm high, caespitose, stems ramified, ground rosette of leaves, glabrous. **Seeds obovate or elliptic, flattish, radicle as long as cotyledons, 1.1-1.3 x 0.7-0.8 mm. Surface glabrous, lustreless, brown. 2n = 16.** Native to the mountains of central and southern Europe from the Pyrenees as far as the Carpathians, on calcareous rocky slits and gravel slopes, up to 3400 m elevation. Pl, Ro, Sk.

**973. *Draba stellata* Jacq., *D. austriaca* Cr.** — Perennial, stems single, erect, up to 3-14 cm, stellately hairy below. **Seeds prolonged ovoid to ellipsoid, flattish, radicle as long as cotyledons, radicle furrow distinct up to the apex, hilum with a raphe, 1.4-1.7 x 0.7-0.9 mm. Surface wrinkly, slight lustrous, reddish-brown. 2n = 16.** Native to the East Alps, on calcareous mountain rocks, stony screes and mountain meadows, up to 2500 m; in the Carpathians rarely cultivated in rock-gardens.

**974. *Draba tomentosa* Clairv., *D. rhaetica* Brügger** — Perennial, caespitose, tomentose, stems up to 10 cm, with a ground rosette of numerous leaves. **Seeds**

**ovate or elliptic, mostly narrowed up to pointed at the apex, flattish, radicle as long as cotyledons, hilum with a raphe, 1.1-1.3 x 0.7-0.8 mm. Surface glabrous, brown. 2n = 16.** Originally growing in central and southern Europe, from the Pyrenees to the Carpathians and the Balkan Peninsula, on calcareous rocky slits and stony slopes, up to 3400 m. Pl, Sk.

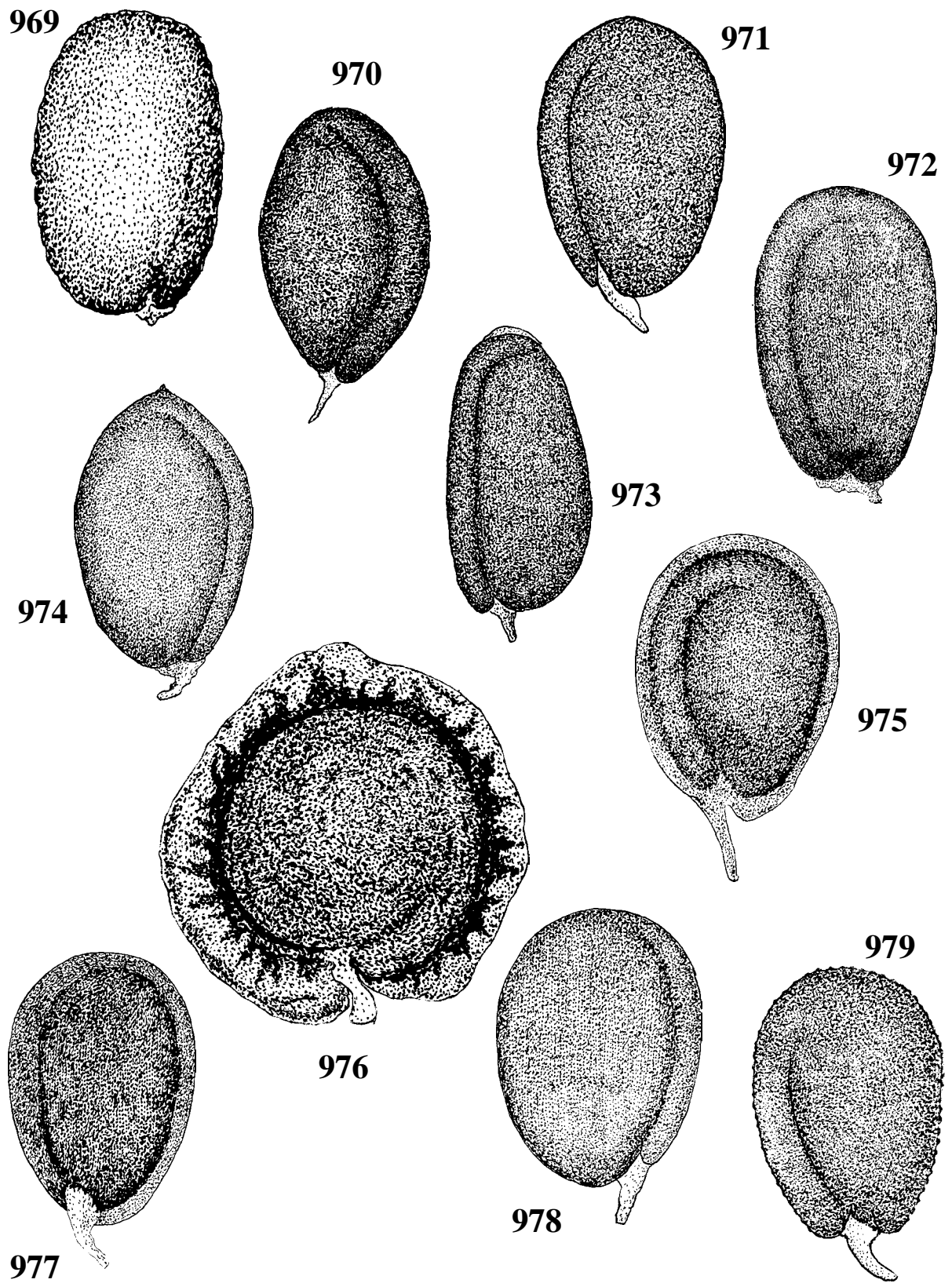
**975. *Alyssum alyssoides* (L.) L., *A. calycinum* L., *Clypeola calyssoides* L.** — Annual, up to 5-30 cm high, stems ascending or erect, branched at base, grey, pubescent. **Seeds obovate-elliptic, radicle shorter than cotyledons, margin complete surrounded with narrow membranous wings, 1.3-1.6 x 1-1.3 mm. Surface glabrous, very fine papillary, orange-brown. 2n = 32.** Native to Europe and northern Africa, in lowlands and uplands, on grassy sunny slopes, roadsides, fields, boundaries. Br, Hu, Mo, Ro, Sk, Uk.

**976. *Alyssum argenteum* All.** — Perennial, whole plant white tomentose, 10-40 cm high, stems ascending, with non-flowering stems. **Seeds rounded, surrounded with irregular membranous wings and indistinct radicular furrow, 2.4-2.8 x 2.4-2.8 mm. Surface fine wrinkly, reddish dark-brown.** Native to the Orient and southeastern Europe; sometimes cultivated in rock-gardens.

**977. *Alyssum bertolonii* Desv.** — Perennial, stems erect, woody at base, 20-35 cm high, branched above, non-flowering stems long. **Seeds obovoid, lateral compressed, complete surrounded with a membranous wing, 1.8-2.2 x 1.3-1.5 mm. Surface dense waved, lustreless, brown.** Originally in the Balkan Peninsula; transiently hauling into the Carpathians.

**978. *Alyssum borzaeanum* Nyár., *A. obtusifolium* Stev. p.p.** — Perennial, up to 10-30 cm high, with numerous erect, rigid stems. **Seeds obovate-elliptic, lateral compressed, with a narrow and short radicle and broad cotyledons, non-winged, raphe short, 1.2-1.5 x 0.9-1.1 mm. Surface glabrous, orange-brown.** Native to southeastern Europe, on maritime littoral sands; sometimes hauling into the Carpathians. Ro, Uk.

**979. *Alyssum caliacrae* Nyár.** — Perennial, procumbent or ascending, stems 10-30 cm high, woody at base, with short or elongate, non-flowering stems. **Seeds ellipsoid, slight compressed, radicle narrow, as long as cotyledons, narrow winged, 1.2-1.4 x 0.9-1 mm. Surface dense waved, faint lustrous,**



**brown, radicle pale-brown.** Native to southeastern Europe. Ro.

**980. *Alyssum desertorum*** Stapf, *A. vindobonense* Beck — Annual, grey-green, up to 10-20 cm high, stems erect, simple or ramified at the base, densely leafy. **Seeds obovate, flattish radicular furrow weakly distinct, complete surrounded with a narrow membranous wing, 1.4-1.8 x 1-1.2 mm. Surface shallow pitted, light-brown. 2n = 16, 32.** Native to Eurasia, in sand-loamy soils of semisteppes, cultivated grounds, open places; throughout the Carpathians.

**981. *Alyssum hirsutum*** M. Bieb. — Annual, up to 40 cm high, stems solitary, densely ramified from the base, leafy. **Seeds circular-elliptic, lateral compressed, narrow radicle shorter than cotyledons, whole circumference winged, 1.7-2.5 x 1.6-2 mm. Surface glabrous, brown, membranous, wings paler.** Native to southeastern Europe, in disturbed and ruderal habitats, tilled lands, steppes. Mo, Ro, Sk, Uk.

**982. *Alyssum linifolium*** Stephan ex Willd. — Annual, stems erect or ascending, 8-35 cm, much branched below, densely grey-pubescent. **Seeds obovate-elliptic, flattish, complete surrounded with a narrow membranous wing, 1.2-1.5 x 0.8-0.9 mm. Surface fine undulated, lustreless, yellowish-brown.** Native to the Balkan Peninsula, southeastern Europe and southern Asia, in open places from lowlands up to 1700 m elevation. Ro.

**983. *Alyssum minus*** (L.) Rothm., *A. parviflorum* M. Bieb. — Annual, up to 40 cm high, fruiting racemes long. **Seeds obovoid, lateral compressed, radicle narrow, cotyledons broad, both equal long, wing up to 0.4 mm wide, 1.8-2.2 x 1.5-1.7 mm. Surface fine undulate, lustreless, reddish-brown. 2n = 16.** Native to southeastern Europe and southwestern Asia; occasionally hauling into the Carpathians.

**984. *Alyssum minutum*** Schlecht. ex DC. — Annual, stems solitary or a few, 5-12 cm high, unramified, leafy. **Seeds elliptic-ovate, radicle as long as cotyledons, apex rounded, hilum with a whitish raphe, 1.3-1.5 x 0.7-0.9 mm. Surface verrucose, slight lustrous, orange-brown.** Native to the eastern part of the Balkan Peninsula, the South Carpathians, as far as Asia Minor, in sunny places, fields, roadsides. Mo, Ro, Uk.

**985. *Alyssum montanum*** L. — Perennial, up to 10-30 cm high, hirsute, stems procumbent or ascendent, ramified at base. **Seeds elliptic, flattish, radicle shorter than cotyledons, complete surrounded with membranous wings, 1.5-1.9 x 1.1-1.3 mm. Surface verrucose, yellowish-brown. 2n = 16, 42.** Native to most of Europe, except the north and southwest, on sandbanks, sunny calcareous rocks and stony slopes; in the whole Carpathians, often cultivated in gardens as an ornamental.

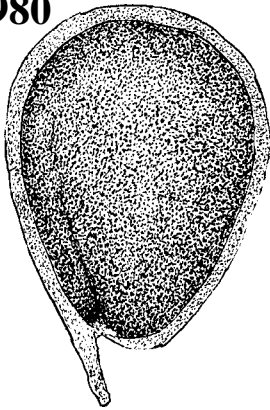
**986. *Alyssum murale*** Waldst. et Kit., *A. argenteum* auct. — Perennial, caespitose, up to 20-50 cm high, stems erect, hirsute, ramified below, with leaves rosette. **Seeds circular or obovate, strong flattish, radicle slight shorter than cotyledons or of the same length, wing c. 0.5 mm wide, 2.7-3.2 x 2.3-2.7 mm. Surface very fine tuberculate, reddish-brown, membranous margin yellowish. 2n = 30.** Native to the Balkan Peninsula; cultivated in rock-gardens as an ornamental plant. Mo, Ro, Sk, Uk.

**987. *Alyssum repens*** Baumg. — Perennial, up to 15-40 cm high, stems simple or ramified, suberect or decumbent, leafy. **Seeds spherical to slight ellipsoid, compressed, whole circumference hemmed, radicle shorter than cotyledons, hilum with raphe, 2.3-2.7 x 2-2.3 mm. Surface reticulate-foveolate, faint lustrous, orange- or dark-brown. 2n = 48.** Native to the East Carpathians and the Balkan Peninsula, in montane and subalpine zones, on rocky slopes and scrubs. Ro.

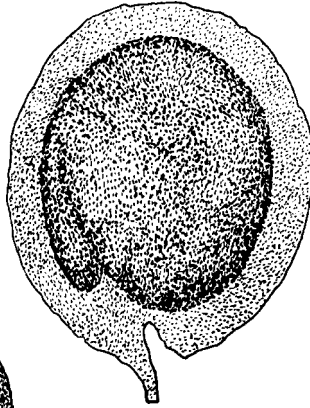
**988. *Alyssum rostratum*** Steven — Annual or biennial, 20-60 cm high, stems solitary, erect or ascendent, branched at base. **Seeds obovate or rounded, flattish, radicle shorter or as long as cotyledons, membranous wing, 0.2-0.4 mm wide, 1.8-2.3 x 1.6-1.8 mm. Surface rough tuberculate, reddish-brown, hem yellowish.** Native to southeastern Europe, dragging into the Carpathians, mostly on railway embankments. Mo, Ro, Uk.

**989. *Alyssum spinosum*** L., *Ptilotrichum spinosum* (L.) Boiss. — Perennial, a small, much-branched shrub, branches spiny, stems up to 60 cm high, leaves silvery-green. **Seeds ellipsoid, lateral compressed, 2.3-2.7 x 1.7-1.9 mm. Surface waved, lustreless, reddish-brown.** Native to Spain and France, on rocks and screes; in the Carpathians rarely cultivated in gardens as ornamental.

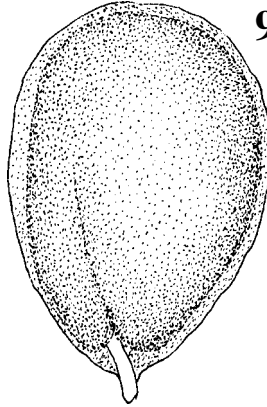
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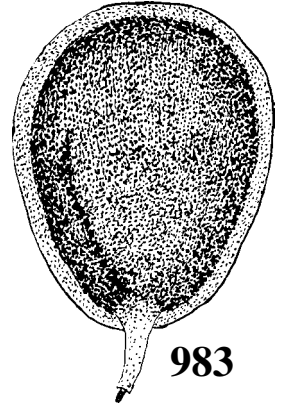
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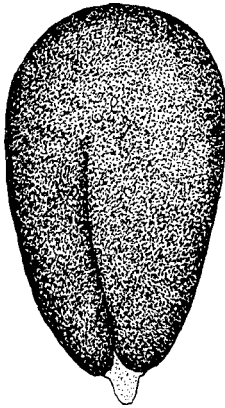
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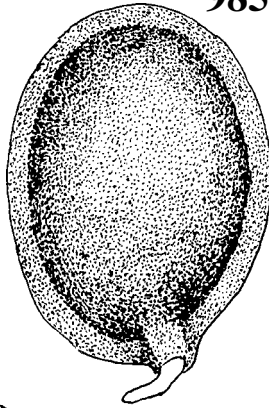
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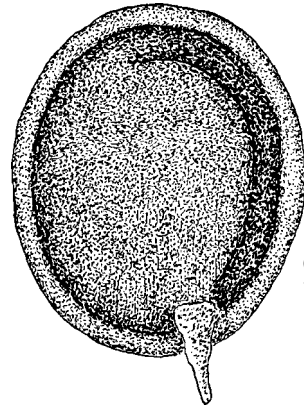
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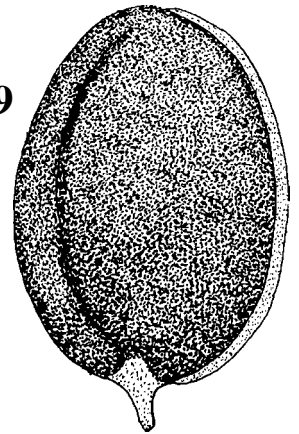
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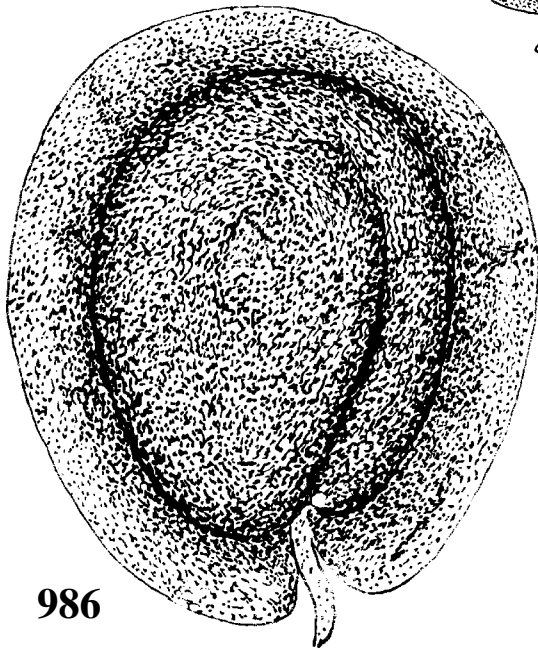
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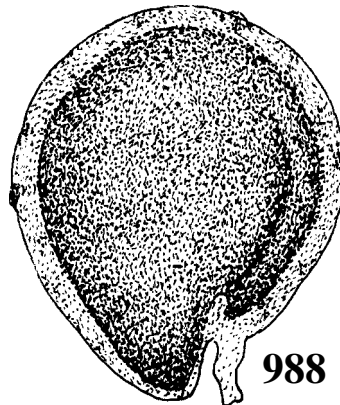
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**990. *Alyssum střibrnyi*** Velen. — Perennial, up to 6-20 cm high, flowering stems unbranched. **Seeds ellipsoid, compressed, radicle shorter than cotyledons, radicular furrow ends at the apex and base, raphe prolonged into a thread beak, wing absent or narrow, 1.4-1.7 x 1-1.2 mm. Surface faint reticulate-foveolate, lustrous, dark orange-brown, sometimes with a piece of membranous wing.** Native to the central Balkan Peninsula, in scrubs, grassy, stony, parched slopes. Ro.

**991. *Alyssum tortuosum*** Waldst. et Kit. — Perennial, stems procumbent or ascending, 10-40 cm long, slender, woody at base, non-flowering stems up to 60 cm. **Seeds elliptic or ovate, flattish, radicle as long as cotyledons, hilum with raphe, non-winged, 1.4-1.8 x 0.9-1.1 mm.** An Eurosiberian element, on sandy steppes, calciferous and dolomitic rocks. Hu, Mo, Ro, Sk, Uk.

**992. *Alyssum utriculatum*** Waldst. et Kit., *Alyssoides utriculata* (L.) Medicus, *Vesicaria utriculata* DC — Perennial, a plant with a rich leafy rosette, flowering stems erect, 20-50 cm high, glabrous, leafy, simple. **Seeds roundish, lateral strong compressed, with broad wing around, radicle narrow, as long as the broad cotyledons, 5-5.6 x 4.8-5.4 mm. Surface fine granulate, faint lustrous, reddish-brown, wing waved.** Native to the Balkan Peninsula and Asia Minor, rare on rocks and the woods. Ro.

**993. *Bunias erucago*** L., *B. dubia* Zapal. — Annual or biennial, hispid, glandular, 20-60 cm high, stems often violetish, branched. **Fruits achenes, indehiscent, woody, oblong ovoid, 4-angled, with 4 cristate wings, with subconical beak, 8-12 x 4-5 mm. Surface glandulous. Seeds suborbicular, flattened, radicle longer than cotyledons, cotyledons spirolobal, usually loose, 2.5-3 x 2-2.6 mm. Surface smooth. 2n = 14.** Originally growing in the Mediterranean and Asia Minor, in lowland and upland, on relative dry, fertile soils, as a weed in fields, fallows, vineyards. Pl, Ro.

**994. *Bunias orientalis*** L., *Laelia orientalis* (L.) Desv. — Biennial, 30-120 cm, stems erect, much branched in upper part, verrucose glandular. **Fruits achenes, mostly ovoid, rarely suboblong and slightly constricted at middle, gradually tapering to apex, apex with beak-like style, base rounded, wall ligneous, 5.5-6.5 x 4-5 mm. Surface glabrous, woody, tuberculate, buff-brown. Seeds subglobose, plump, tip of radicle projected, cotyledons curved**

**in spiral, 2.6-3.2 mm in diam. Surface glabrous, orange-brown. 2n = 14.** Originally growing in eastern Europe and Orient, as weed on fields (cereals) and meadows; in the whole Carpathians.

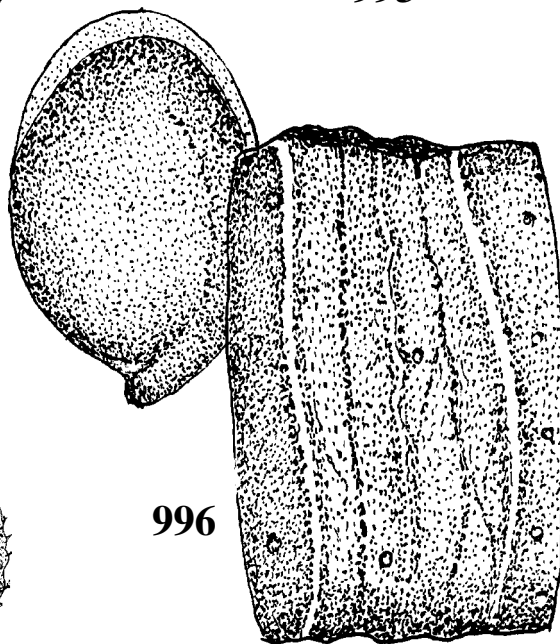
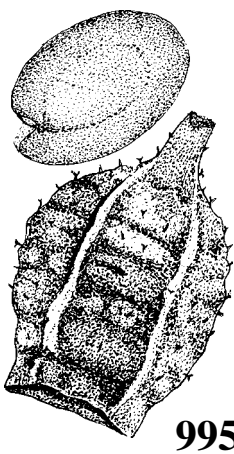
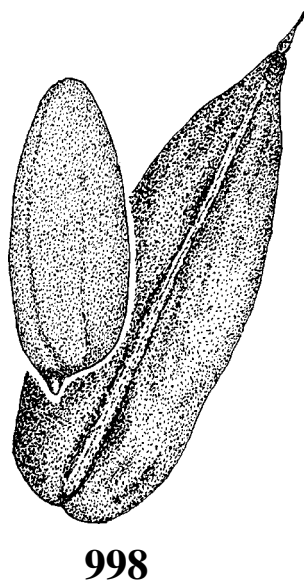
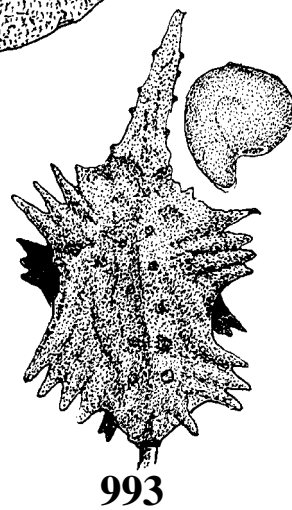
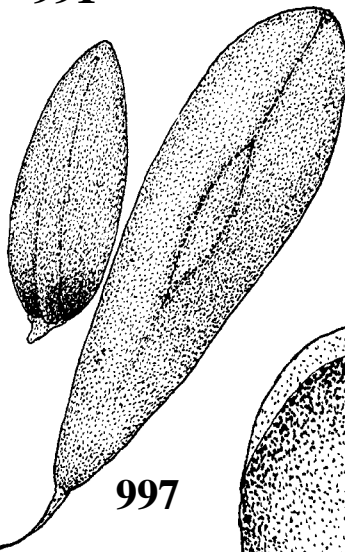
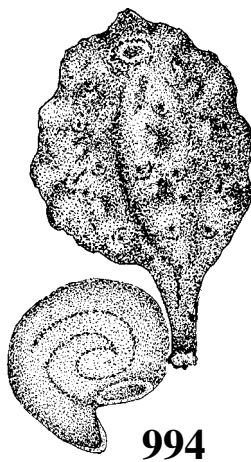
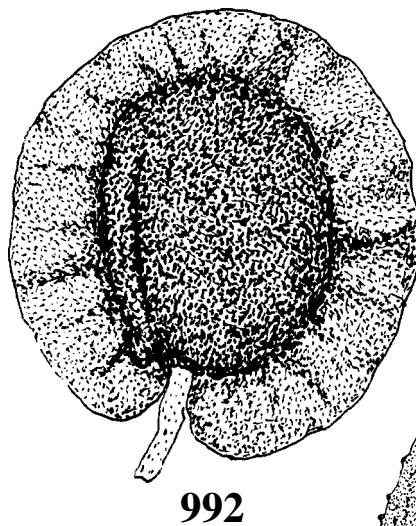
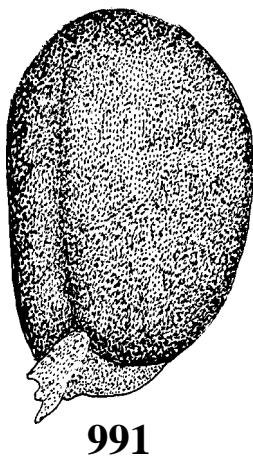
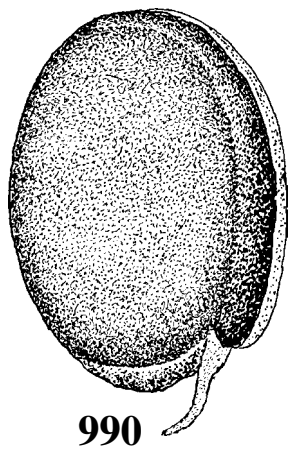
**995. *Euclidium syriacum*** (L.) R. Br., *Anastatica syriaca* L. — Annual, 20-35 cm high, hirsute, stems erect, much branched, angular, grey-pubescent throughout. **Fruits achenes, ellipsoid, with small beak, indehiscent hairy, 3-3.5 x 1.7-2 mm. Seeds elliptic or spherical, radicle longer than cotyledons, 1.6-2 x 1.2-1.3 mm. Surface glabrous, brown. 2n = 14.** Native to eastern and eastcentral Europe, southwestern Asia, rarely causal elsewhere, on grassland, way and fields borders. Hu, Mo, Pl, Ro, Sk, Uk.

**996. *Chorispora tenella*** (Pall.) DC., *Raphanus teneluss* Pall. — Annual, hirsute, glandular, stems 5-30 cm high, simple or ramified, erect. **Fruits sili-cles, biloments, cylindric, elongate feeble winged, flattish, 2-2.4 x 1.3-1.6 mm. Surface strawly coloured. Seeds obovate, flattish, on apex winged, 1.5-2 x 1-1.3 mm. Surface glabrous, brown. 2n = 14.** Native to southeastern Europe and Asia; in the Carpathians dragging on railbanks, waste grounds, embankments and fields. Br, Mo, Ro, Sk, Uk.

**997. *Isatis campestris*** Steven ex DC., *I. tinctoria* subsp. *campestris* (Steven ex DC.) Kulcz. — Perennial, very similar to *I. tinctoria*. **Fruits sili-cles, oblong to oblanceolate, flattened, longitudinally ridged at the center of each side, on base narrowed, on apex rounded, gradually tapered to a slender stalk, widely winged, 4x longer than wide, 10-13 x 3.5-4.5 mm. Surface glabrous to pubescent, strawly-brown. Seeds prolonged ovate, narrowly oblong, plump, cotyledons incumbent or accumbent, wingless, 2.5-2.8 x 1-1.2 mm. Surface smooth, glabrous, lustrous, reddish-brown to purplish-black. 2n = 14.** Native in the Carpathians, only on some localities. Mo, Sk, Uk.

**998. *Isatis maeotica*** DC. — Perennial, from other species is distinguish by prolonged (15-22 mm long) fruits. **Fruits silicles, oblong to oblanceolate, on base narrower, on apex obtuse, distinct cut-out, gradually tapered to a slender stalk, 4-5x longer than wide, 15-17 x 3.5-4.5 mm. Seeds prolonged ovate, 3.2-3.7 x 1.3-1.6 mm. Surface glabrous, yellowish-brown. 2n = 14.** Native in Carpathians, in light forest, only on one locality in Slovakia.





**999. *Isatis praecox*** Kit. ex Tratt. — Perennial, very similar to *I. tinctoria*. **Fruits silicles, obovate-elliptic, central rib slender, apex distinct cut out, gradually tapered to a slender, longer curved stalk, 8-10 x 3.8-4.2 mm. Surface glabrous or pubescent. Seeds prolonged ovate, radicle a little longer than cotyledons, 2.8-3.2 x 1-1.2 mm. Surface lustreless, glabrous, orange-brown. 2n = 14.** Native in central, east and southeastern Europe, on shrubby and stony slopes, and rocks in karst regions. Hu, Mo, Ro, Sk, Uk.

**1000. *Isatis tinctoria*** L., *I. glauca* Gilib. — Biennial, stems 50-100 cm high, on bottom dispersely hirsute, dense leafy, ramified. **Fruits silicles, usually oblong- or elliptic-obovate, with 3 longitudinal ribs, gradually tapered to a slender stalk, widely winged, 3-5x longer than wide, 13-25 x 4-6 mm. Surface glabrous or pubescent, dark violet. Seeds elliptic-oblong, apex rounded, radicle as long as cotyledons, furrow distinct, 2.8-3.5 x 1.1-1.5 mm. Surface smooth, faint lustrous, orange-brown. 2n = 28.** Native in south Russian steppes and west Asia, on embankments, meadows, pastures, vineyards, stony slopes; in warmer areas of the whole Carpathians.

**1001. *Myagrimum perfoliatum*** L. — Annual, wintering, bare, blue hoary, stems erect, 20-80 cm high, sometimes ramified, glaucous. **Fruits silicles, obovoid-pyriform, short beaked, indehiscent, 8-10 x 4.5-5.2 mm. Surface straw-brown. Seeds ellipsoid, slight flattish, 2.6-3 x 1.3-1.6 mm. 2n = 14.** Probably native to southern Europe, naturalized or casual in the Carpathians, on synanthropical stands. Hu, Mo, Ro, Sk, Uk.

**1002. *Alliaria petiolata*** (M. Bieb.) Cavara et Grande, *A. officinalis* Andr. ex M. Bieb. — Annual or perennial, 20-100 cm high, stems erect, dense ramified, hirsute mostly only at the bottom. **Fruits silicles, elliptic, apex often acuminate, base often truncate, radicle and cotyledons equal in length, 2.5-3.2 x 1.1-1.3 mm. Surface with distinct longitudinal, obtuse ribs, blackish-brown to black. 2n = 36, 42.** Native throughout Europe, but less common in the extreme south, in forests, hedges, thickets and shadow places; throughout the Carpathians.

**1003. *Aubrieta columnae*** Guss., *A. croatica* (Schott Nyman et Kotschy) — Perennial, more or less caespitose to struggling stems slender, up to 10 cm high, siliques usually not more than 12 mm. **Seeds rounded, oval or obovoid, lateral compressed radicle and cotyledons mostly equal in length, 1.4-1.7 x**

**1-1.2 mm. Surface wrinkly, brownish-black.** Native to southern Europe; in the Carpathians seldom cultivated in some cvs in rock gardens.

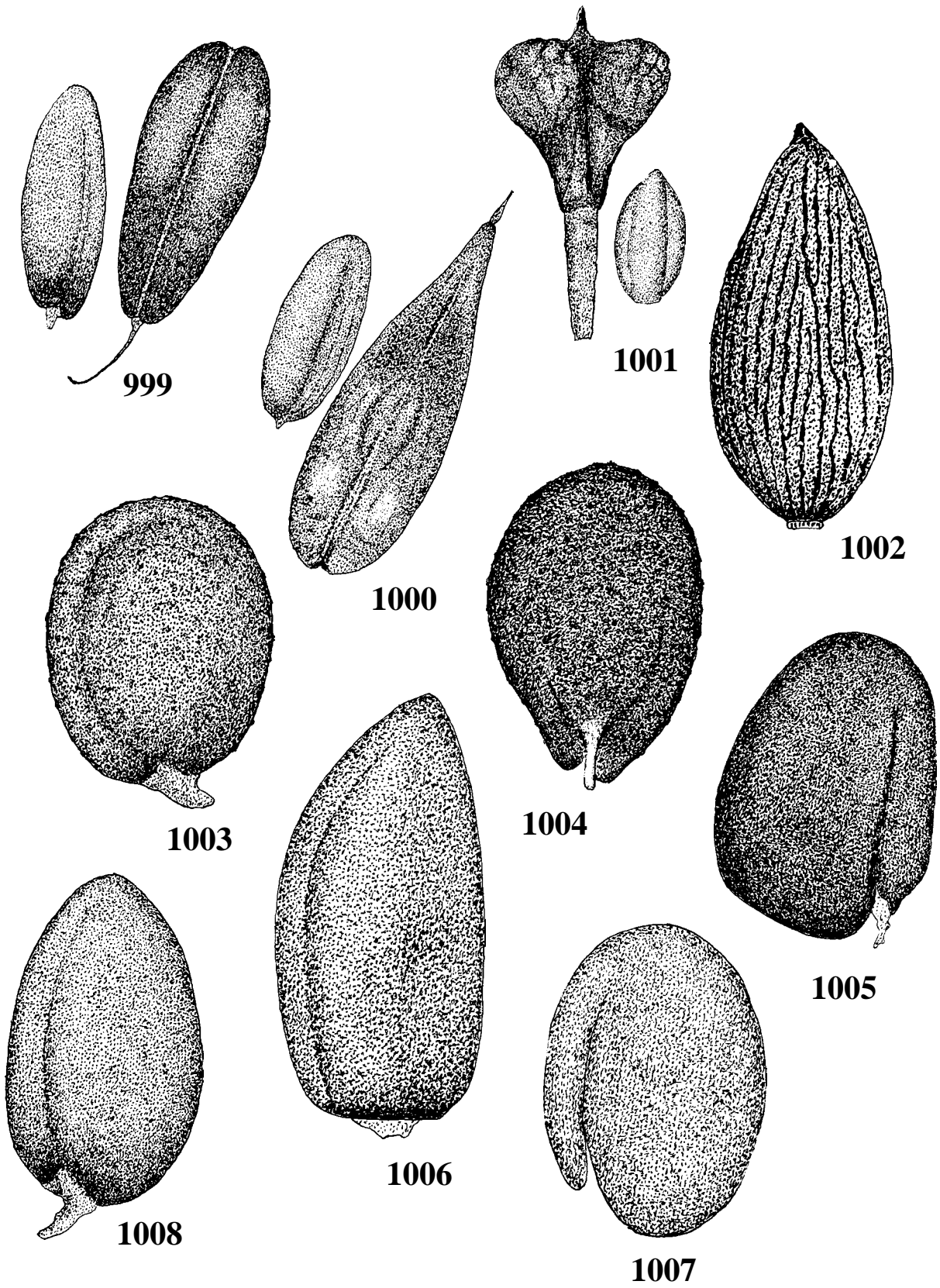
**1004. *Aubrieta deltoidea*** (L.) DC., *Alyssum deltoideum* L. — Perennial, low, tufted, 5-15 cm high, hirsute, stems ascendent,  $\pm$  ramified. **Seeds cylindric-obovate, apex rounded, radicle and cotyledons near equal in length, 1.4-1.8 x 1.1-1.3 mm. Surface coarsely wrinkly, brownish to black. 2n = 16.** Native to the mountains of southern Europe, a high-mountain plant; often cultivated in rock-gardens, rarely escaping. Au, Hu, Sk.

**1005. *Aubrieta intermedia*** Heldr. et Orph. ex Boiss. — Perennial, habit variable, leaves obovate to rhombic. **Seeds ovoid, lateral compressed, radicle shorter than broad cotyledons, hilum with whitish raphe, 1.4-1.6 x 1.1-1.3 mm. Surface wrinkly and waved, glossy, brownish-black.** Native to the southern half of the Balkan Peninsula; in the Carpathians rarely cultivated in gardens as an ornamental. Au.

**1006. *Caulopsis alpina*** (L.) Fourr., *C. pauciflora* (Grimm.) Á. et D. Löve, *Arabis pauciflora* (Grimm) Garcke — Perennial, 30-100 cm high, bare, stems erect, little ramified, leafy. **Seeds prolonged pyramidal, apex acuminate, base truncate, 2-2.4 x 0.9-1.1 mm. Surface slight wrinkly or rugulose, reddish-brown. 2n = 14.** Native to central and southern Europe, in lowlands, mountains and subalpine zones, in light forests, shrubberies and overgrown rocks. Sk.

**1007. *Clypeola jonthlaspi*** L. — Annual, stems erect, up to 20-30 cm high, ramified at base, procumbent or ascendent, grey-pubescent. **Seeds ellipsoid-obovate, flattish, radicle as long as cotyledons or shorter, without wing, 1.4-1.6 x 1.2-1.3 mm. Surface slight wrinkly and lustrous, orange-brown.** Native to the Mediterranean, in grassy, dry, stony places, on loess soil. Ro.

**1008. *Schivereckia podolica*** (Bess.) Andr., *Alyssum podolicum* Bess., *Moenchia podolica* Bess. — Perennial, a plant with rosette of leaves, flowering stems 8-25 cm high, simple or with 1-2 branches. **Seeds prolonged ovate, flattish, non-winged, 1-1.4 x 0.6-0.8 mm. Surface rugulose, pale- to dark-brown.** Native to southeastern Europe, on limestone rocks, dry, stony slopes, mostly in river valleys. Mo, Ro, Uk.



**1009. *Peltaria alliacea*** Jacq., *P. perennis* (Ard.) Markgr. — Perennial, stems 30-60 cm high, erect, leafy, glabrous, simple or ramified in the upper part. **Seeds prolonged ovate, flattish, non-winged, radicle shorter than cotyledons, 3.5-4 x 2.4-2.8 mm. Surface slight rugulose, light-brown.** Native to central and southeastern Europe and western Asia, in stony and shrubby places, on crumbled rocks and banks of forest brooks. Hu, Ro.

**1010. *Arabis alpina*** L., *A. crispata* Willd. — Perennial, 6-40 cm high, with 2-5 leafy rosette, stems and leaves hirsute. **Seeds elliptic to circular, with winged margin, seed base rare non-winged, 1.3-1.7 x 1-1.2 mm. Surface rugulose and very fine reticulate, reddish-brown with a darker marginal line, wing yellowish-brown. 2n = 16.** Native to the mountain and alpine zones of western and central Europe, rare in the east, on moist, wastes, shadow rock sites, torrent banks with calcareous soils. Hu, Pl, Ro, Sk, Uk.

**1011. *Arabis auriculata*** Lam., *A. recta* Vill., *Turritis patula* Ehrh. — Annual, 10-40 cm high, downy, stems erect, simple, seldom branched. **Seeds elliptic, radicle as long as cotyledons, without winged margin, 1.2-1.5 x 0.8-0.9 mm. Surface fine undulate, faint glossy, dark-brown with near blackish margin. 2n = 16.** Native to southern as far as central Europe, southern Asia and northern Africa, on dry, stony, grassy and shrubby slopes with calcareous and loess soils. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**1012. *Arabis bellidifolia*** Jacq., *A. jacquinii* G. Beck — Perennial, stems glabrous, 15-35 cm high, bare, leaves fleshy, glabrous. **Seeds ellipsoid, lateral compressed, radicle as long as cotyledons, margin non-winged, 0.9-1.1 x 0.6-0.8 mm. Surface dense undulate, glossy, dark-brown. 2n = 16.** Native to the Alps and West Carpathians, along springheads and brookbanks. Pl, Ro.

**1013. *Arabis caucasica*** Willd., *A. albida* Steven ex J. Jacq. — Perennial, 10-40 cm high, leaves white-felted, stem leaves clasping. **Seeds elliptic to circular, mostly winged, seldom wingless, 1.4-1.7 x 0.9-1.1 mm. Surface conspicuous rugulose, reddish-brown. 2n = 16.** Native to southeastern Europe up to the Caucasus; seldom cultivated in rock-gardens, cemeteries, mostly in full-blossom forms.

**1014. *Arabis ciliata*** Clairv., *A. alpestris* Schleich., *A. corymbiflora* Vest — Biennial to perennial, 8-30 cm

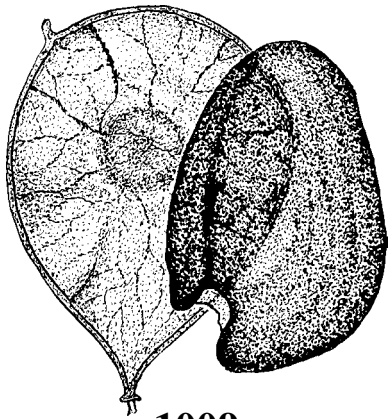
high, stems ascendent, erect, simple or ramified. **Seeds mostly elliptic, angular or ovate, flattish, without a wing at margin, 0.9-1.1 x 0.6-0.8 mm. Surface distinct undulate, reddish-brown with a darker margin. 2n = 16.** Native to the mountains of Europe, on calcareous rocks and screes, grassy slopes, stony lawns, fairly dry to moist soils. Pl, Ro.

**1015. *Arabis glabra*** (L.) Bernh., *A. perfoliata* Lam., *Turritis glabra* L. — Biennial, 60-120 cm high, stem erect, mostly simple, roughly hirsute below, bare, glaucous above. **Seeds irregular-shaped, mostly obovoid to crescent, radicle as long as cotyledons, tip of radicle acute or subacute, tip of cotyledons rounded or truncate, sometimes narrow winged, 0.8-1.2 x 0.5-0.7 mm. Surface fine undulate, glabrous fine reticulate, barely lustrous, reddish-brown. 2n = 16.** Native to Europe, in light woods, shrubberies, thickets, clearings, overgrown rocks and screes, on warm, humous, calcareous grounds. Cz, Hu, Mo, Pl, Ro, Sk, Uk.

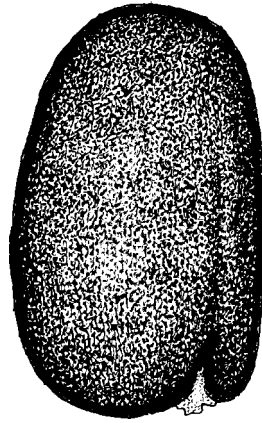
**1016. *Arabis hirsuta*** (L.) Scop., *Turritis hirsuta* L. — Biennial, 10-80 cm high, hirsute, stems undulated, ramified. **Seeds oblong-elliptic, flattish, radicle a little shorter than cotyledons, apex rounded, base truncate, apex often and base sometimes winged, 1.1-1.5 x 0.7-0.9 mm. Surface very distinct undulate, glossy, reddish-brown with darker marginal line. 2n = 16, 32.** Native to Eurasia and North America, on dryer, sandy warmer slopes, meadows, light forests, wet rocks of mountains. Br, Hu, Mo, Pl, Ro, Sk.

**1017. *Arabis hornungiana*** Schur — Biennial, light-green, stems non-branched, 10-50 cm high, hairy at the bottom. **Seeds oblong to rounded, flattish, margin with a broader wing, 1.3-1.7 x 1-1.2 mm. Surface glabrous, dark cinnamon-brown. 2n = 32.** Originally growing in the Carpathians and the northern Balkan Peninsula, on sunny rocks, stony dry-slopes, sandy soils. Ro, Sk, Uk.

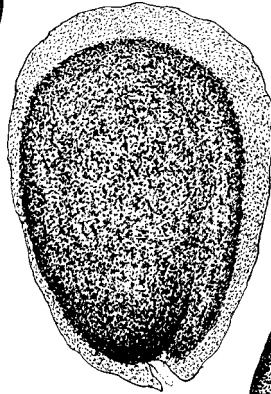
**1018. *Arabis jacquinii*** Beck, *A. serpyllifolia* Schur — Perennial, stems single or manifold, ramified, with leaves rosette above. **Seeds ellipsoid up to rounded, lateral compressed, radicle narrower than cotyledons, margin with a broader wing, 1.6-1.8 x 1.3-1.5 mm. Surface undulate, broad winged, lustreless, reddish-brown.** Native to mountains of the Carpathians, the Alps and the Pyrenees, on moist rock places and slopes, in the alpine zone. Ro.



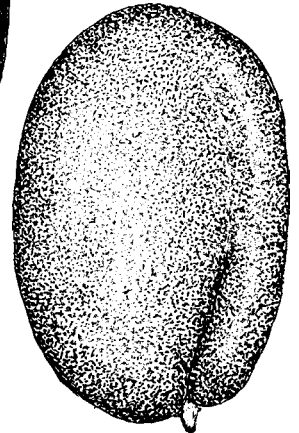
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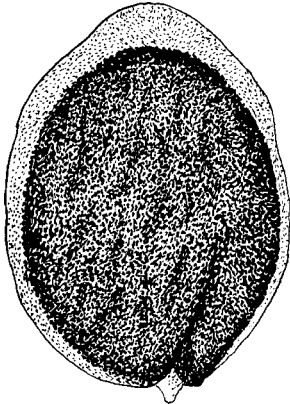
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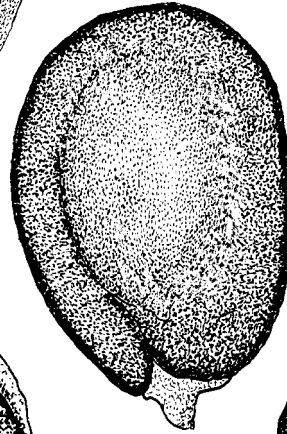
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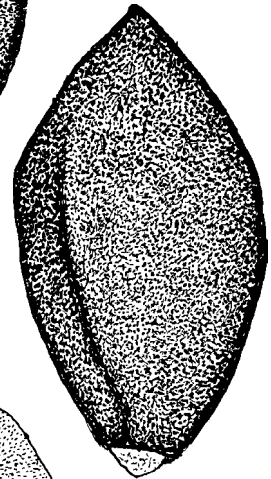
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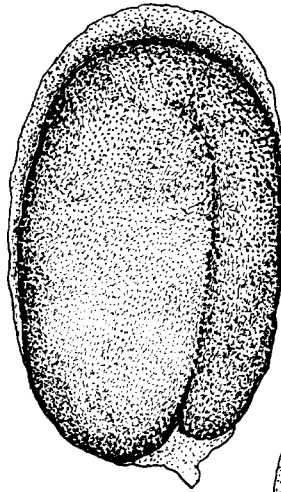
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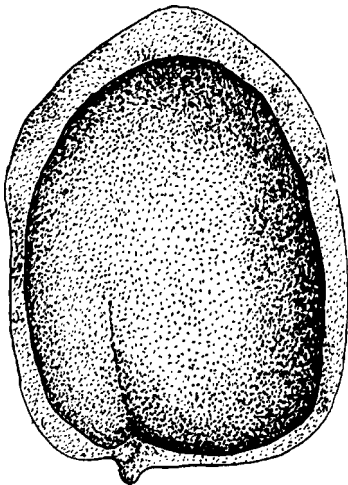
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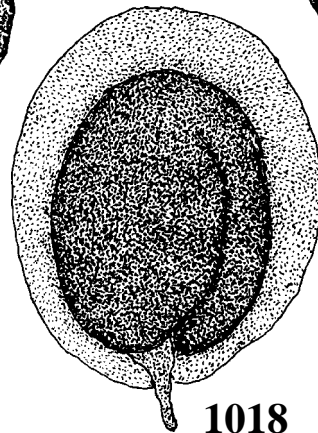
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**1019. *Arabis muralis*** Bertol. — Perennial, pale-green, 10-30 cm high, often branched from the base, stems pubescent below, glabrous above. **Seeds sub-ellipsoid, apex roundish, bottom truncate, radicle and cotyledons equal long, margin winged, 2-2.4 x 1-1.3 mm. Surface wrinkly and fine undulate, faint lustrous, dark-brown.** Native to southern and south-central Europe, on stony calcareous grounds. Ro.

**1020. *Arabis nemorensis*** (Wolf ex Hoffm.) Rchb., *A. gerardii* (Besser) W. D. J. Koch, *A. planisiliqua* auct. non (Pers.) Rchb. fil. — Biennial, 50-100 cm high, stems glabrous, branched above, frequently reddish. **Seeds ellipsoid, lateral compressed, radicle narrow and as long as much broader cotyledons, 0.9-1.1 x 0.5-0.7 mm. Surface faint undulate, glossy, brown, marginal wing dark-brown. 2n = 16.** Native to central and eastern Europe, Siberia, in moist lowland forests, bogs, meadows, calcareous fens, synanthropic stands. Ro, Sk, Uk.

**1021. *Arabis pieninica*** Woloszczak — Perennial, perhaps subsp. of *A. alpina*, lower leaves greyish lefty, roundish, stem leaves faint, bluntly dentate, flower stalks hairy. **Seeds ± rounded, lateral strong compressed, partial or round semitranslucent margin, 1.4-1.7 x 0.9-1.1 mm. Surface undulate, lustreless, dark-brown. 2n = 16.** Native to the Pieniny mountains (one part of the western Carpathians), on calcite rocks. Pl.

**1022. *Arabis procurrens*** Waldst. et Kit. — Perennial, 10-30 cm high, stems erect, non-ramified, glabrous, appressed hirsute on base. **Seeds elliptic, elliptic-ovate or oblong, apex rounded, flattish, radicle shorter than cotyledons, wingless, 1-1.3 x 0.6-0.8 mm. Surface glabrous, brown. 2n = 16 (32).** Native to the Carpathians and the Balkan Peninsula, on chalky rocks and wastes, on alkaline, stony, shallow soils; in gardens and cemeteries; very precious for evergreen areas creation, as compensation for the grass-plot. Ro, Sk.

**1023. *Arabis sagittata*** (Bertol.) DC., *Turritis sagittata* Bertol. — Biennial, 25-80 cm, hirsute, stems erect, ramified only above. **Seeds elliptic-oblong, flattish, margin narrow winged at least at rounded apex, truncate at base, 1.3-1.5 x 0.8-0.9 mm. Surface, fine punctulate, brown. 2n = 16.** Native to central and southern Europe, rare on dry calcareous slopes, meadows, light forests, dry slopes. Mo, Ro, Sk, Uk.

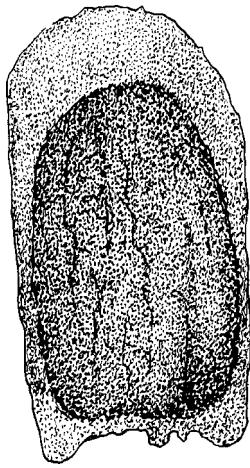
**1024. *Arabis soyeri*** Reut., *A. jacquinii* Beck — Perennial, 15-30 cm high, stems ascendent or erect, almost glabrous, mostly non-branched. **Seeds elliptic-oval, flattish, apex rounded, all margin or its majority winged, 1.8-2.2 x 1.3-1.5 mm. Surface fine undulate, lustreless, brown, wing pale-brown. 2n = 16.** Native to the mountains of western and central Europe, on moist rocks and rocky debris, springheads and torrent banks. Pl, Ro, Sk.

**1025. *Arabis sudetica*** Tausch., *A. allioni* DC. — Perennial, 20-40 cm high, bare, glaucous, stems usually non-branched, hirsute below. **Seeds elliptic-ovate, flattish, apex usually broader, circumference narrow winged, 1.7-2 x 1.3-1.5 mm. Surface fine undulate, brown, wing of the same colour. 2n = 16.** Native to central and southeastern Europe and western Asia, on subalpine lawns and plains, overgrown rocks and rocky debris. Pl, Ro, Sk, Uk.

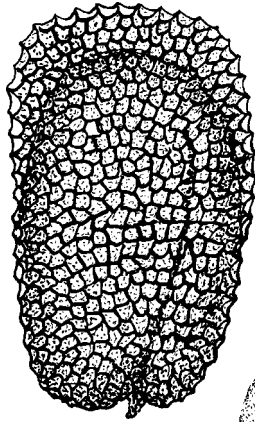
**1026. *Moricandia arvensis*** (L.) DC., *Brassica arvensis* L. — Biennial to perennial, stems roundish, 20-120 cm high, branched, from the base with long twigs. **Seeds obovoid, lateral slight compressed, apex roundish, bottom truncate, with a narrow wing, 1.1-1.3 x 0.8-0.9 mm. Surface fine undulate, lustreless, yellowish-brown.** Native to the Mediterranean region, along roads, on fields, fallows, rarely hauling into the Carpathians.

**1027. *Lunaria annua*** L., *L. biennis* Moench — Annual to biennial, 30-100 cm high, stem erect, sometimes branched, hirsute. **Seeds reniform to circular, flattish, tip of the radicle and cotyledons equal in length, all circumference membranous-winged, 7.5-8.5 x 6.2-7 mm. Surface indistinct reticulate or rugose, seed-loculus nut-brown, wing henna. 2n = 30.** Native only to southern and eastern Europe; cultivated in gardens as an ornamental, seldom escaping. Hu, Mo, Pl, Ro, Sk, Uk.

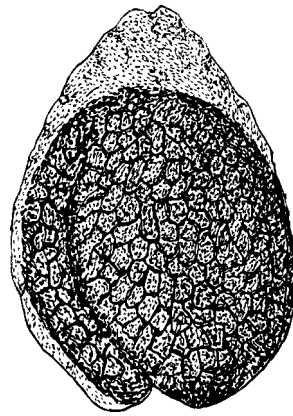
**1028. *Lunaria rediviva*** L., *L. odorata* Lam. — Perennial, 30-140 cm high, stems from ascending base erect, angular, whitish hirsute, branched above. **Seeds broad reniform, flattish, tip of radicle and cotyledons equal in length, margin with a narrow wing around, 8.5-9.5 x 6-6.5 mm. Surface with an indistinct reticulum, nut-brown, wing reddish-brown. 2n = 30.** Native to Europe, in forests, in stony soil rich in humous, on moist stands; in the whole Carpathians.



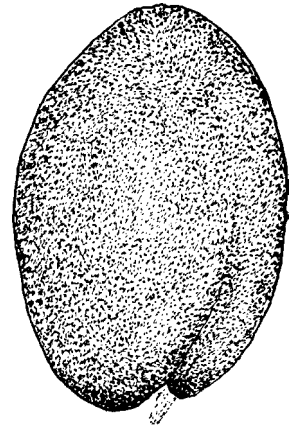
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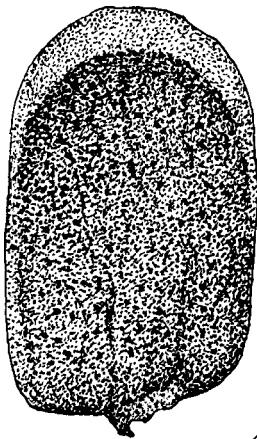
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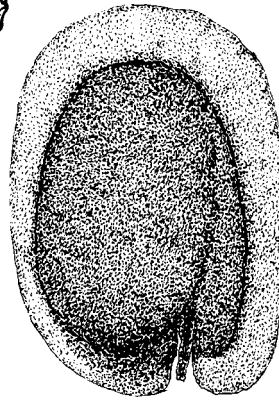
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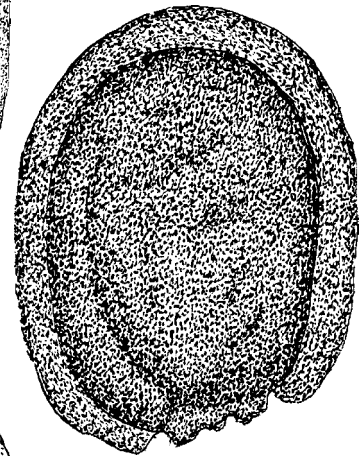
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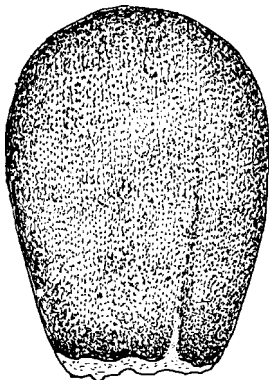
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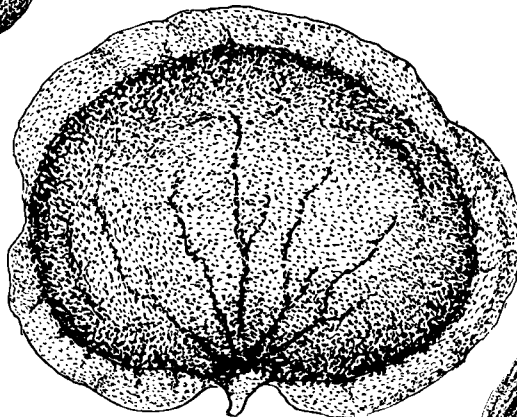
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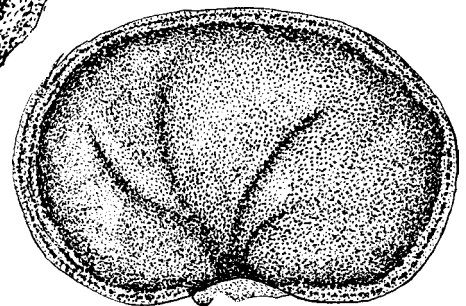
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**1029. *Mathiola incana* (L.) R. Br., *M. annua* Sweet, *Cheiranthus incanus* L.** — Biennial to perennial, 20-80 cm high, greyish downy, stems erect, woody at base, ground leaves in a rosette. **Seeds oval or circular, flattish, whole circumference winged with a whitish membrane, 2-2.6 x 2.2-2.8 mm. Surface glabrous, olive to auburn-brown. 2n = 14.** Originally spread from the eastern Mediterranean; in the Carpathians often cultivated in gardens as ornamental in many cvs, rarely escaping. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**1030. *Mathiola longipetala* (Vent.) DC., *M. oxyceras* DC., *Cheiranthus longipetalus* Vent.** — Annual, 20-50 cm high, stems erect. **Seeds elliptic-obovate, flattish, all circumference narrow winged, 2-2.5 x 1.1-1.5 mm. Surface rugulose, auburn-brown, hem whitish to saffron-orange.** Native to Greece and Asia Minor, seldom dragging into other countries; a multi-form species with pink or purple flowers, often cultivated in gardens of warmer regions. Hu, Mo, Ro, Uk.

**1031. *Malcolmia africana* (L.) R. Br., *Hesperis africana* L.** — Annual, stems erect, stellately hairy, 20-40 cm high, simple or ramified at base. **Seeds oblong-elliptic, lateral compressed, with a blackish stripe on ventral side of the cotyledons, 1.3-1.5 x 0.5-0.6 mm. Surface covered with fine white hair-lets, rusty-brown, lustreless. 2n = 48.** Originally growing in the Mediterranean, on roadsides, waste places, often as a weed of fields with sandy soil. Hu, Mo, Ro, Sk, Uk.

**1032. *Malcolmia chia* (L.) DC., *Cheiranthus chius* L.** — Annual, 10-20 cm high, hairs 2-4 arms, leaves prolonged obovate. **Seeds irregular oblong-elliptic and compressed from sides, apex slanting, radicle and cotyledons ± equal length, hilum with a raphe, 1.4-1.6 x 0.7-0.9 mm. Surface glabrous, faint lustrous, reddish-brown. 2n = 32.** Native to the Mediterranean, on rocky slopes; in the Carpathians seldom cultivated as a summer plant in gardens.

**1033. *Malcolmia maritima* (L.) R. Br., *Cheiranthus maritimus* L., *Hesperis maritima* (L.) Lam.** — Annual, stems ascendent, 10-35 cm high, with medifixed or 3- to 4-fid hairs. **Seeds elliptic-obovate, transversal section triangular, radicle expressive pushed out and as long as cotyledons, 1.6-2 x 0.6-0.8 mm. Surface glabrous, rusty-brown. 2n = 14.** Native to the Mediterranean, naturalized in maritime sands, elsewhere in southern Europe; in the Carpathians widely cultivated for ornament.

**1034. *Hesperis candida* Kit., *H. matronalis* subsp. *candida* (Kit. et Hayek) Theil** — Biennial to perennial, 40-80 cm high, bottom leaves bare or with simple and scattered glandular hairs. **Seeds prolonged ellipsoid, apex with a small beak, radicle as long as cotyledons, 2.9-3.3 x 1-1.2 mm. Surface longitudinal pitted or undulate, lustrous, dark-brown. 2n = 24.** Native to the mountains ranging from the Carpathians up to the Pyrenees, in humous, leafy woods, shady shrubberies, often in calcareous soils. Ro, Sk, Uk.

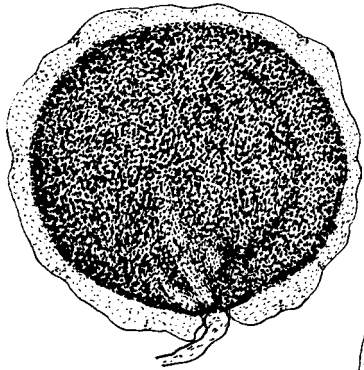
**1035. *Hesperis matronalis* L., *H. carpatica* Zapal.** — Biennial to perennial, 40-80 cm high, with simple or ramified hairs, stems erect, mostly ramified. **Seeds oblong-elliptic or ovate-elongate, apex usually truncate, hilum with a callus, 2.2-2.8 x 0.9-1.1 mm. Surface sometimes olveolate or ocellate, reddish-brown. 2n = 24.** Native to southern Europe, scattered on damp or shaded habitats; often cultivated in gardens as an ornamental plant; in the whole Carpathian territory.

**1036. *Hesperis nivea* Baumg., *H. matronalis* subsp. *nivea* (Baumg.) Kulcz.** — Perennial, 60-100 cm high, stems erect, dense pubescent with short and long, branched and unbranched hairs. **Seeds oblong-ovate, longitudinal ribbed on ventral side, hilum with a callus, 3-3.5 x 1.2-1.5 mm. Surface minute pitted or rugulose, dull, auburn-brown. 2n = 24 (26).** Carpathians endemic, on rocky and shrubby slopes, calcareous stands. Pl, Ro, Sk, Uk.

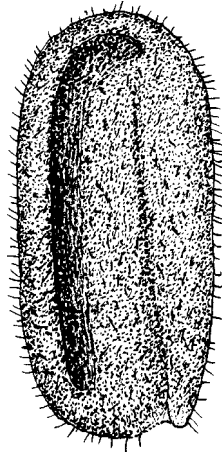
**1037. *Hesperis sibirica* L., *H. matronalis* subsp. *sibirica* (L.) DC.** — Biennial or perennial, stems erect, 50-120 cm high, hirsute-glandular, branched. **Seeds ellipsoid, biconvex, ribbed on the ventral side, apex with a broad beak, 3.2-3.6 x 1.4-1.6 mm. Surface fine undulate, dull or faint lustrous, dark-brown. 2n = 24.** Native to Asia (the Caucasus), in moist woods, shrubberies, river valleys; in the montane zone; cultivated in gardens as an ornamental. Pl, Ro, Uk.

**1038. *Hesperis sylvestris* Crantz., *H. runcinata* Waldst. et Kit.** — Biennial to perennial, stems erect, 40-100 cm high, sticky, glandulous from simple hairs, downy. **Seeds prolonged elliptic, apex sometimes with a narrow wing, radicle longer than cotyledons, 2.6-3 x 1-1.4 mm. Surface lustreless, pitted in longitudinal rows, cinnamon-brown. 2n = 12.** Native to the Eurasian continent, in light forests,

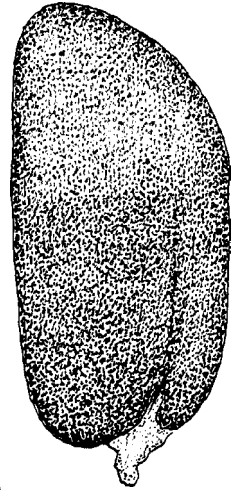




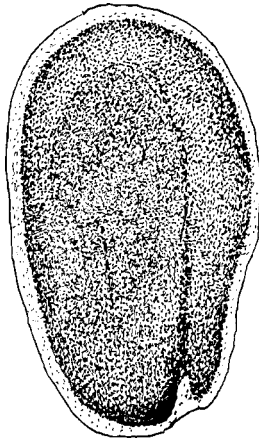
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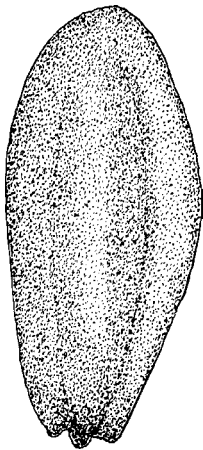
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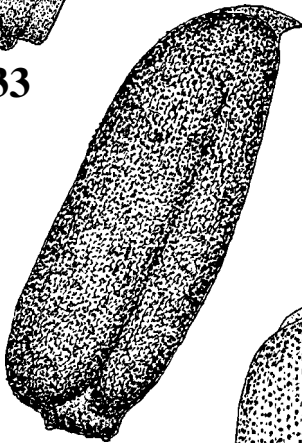
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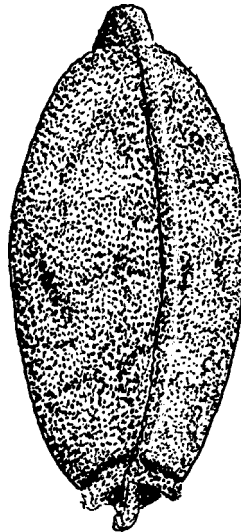
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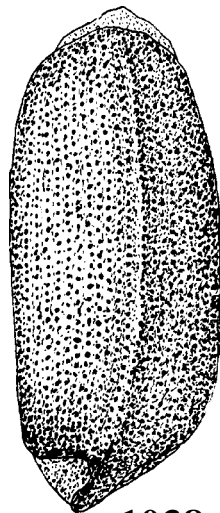
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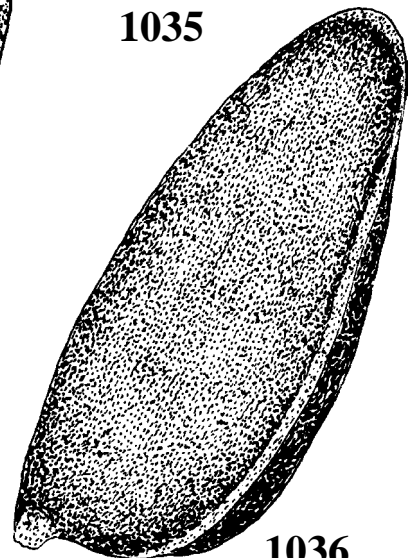
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shrubberies, waste forests with plant undergrowth. Hu, Mo, Pl, Ro, Sk.

**1039. *Hesperis tristis* (L.), *Deilosma tristis* (L.) Spach, *H. desertorum* Velen.** – Biennial to perennial, 30-60 cm, stems ramified on the bottom part, glandulous, hispid. **Seeds oblong-ovoid or oval with a deep furrow on the ventral side, 1.8-2.3 x 1-1.2 mm. Surface fine pitted or rugulose, lustreless, brown. 2n = 14.** Native to the Eurasian continent, in light forests, shrubberies, pastures, in warmest areas, on calcareous stands. Hu, Mo, Pl, Ro, Sk, Uk.

**1040. *Cheiranthus cheiri* L., *Erysimum cheiri* (L.) Crantz** – Biennial to perennial, 30-70 cm high, stems ascendent or erect, branched, angular, with disunite hairs. **Seeds elliptic, with a narrow wing, mostly at the apex only, 2.3-3.2 x 1.7-2.1 mm. Surface wrinkly, fine pitted, slight lustrous, reddish-brown. 2n = 14.** Native to southern Europe on rocky slopes; widely cultivated in gardens for ornament and naturalized on walls, cliffs, rocks, in warmer parts of the Carpathians. Hu, Mo, Pl, Ro, Sk, Uk.

**1041. *Arabidopsis thaliana* (L.) Heynh., *Arabis thaliana* L., *Stenogramma thalianum* (L.) Čelak.** – Annual or biennial, 5-40 cm high, stems erect, simple or branched, hirsute below. **Seeds elliptic, weakly flattish, apex rounded, radicle ± as long as cotyledons, 0.5-0.7 x 0.3-0.4 mm. Surface glabrous, fine undulate, lustrous, orange-brown. 2n = 10.** A cosmopolitan species, native to Europe and western Asia, in fields, fallows, roadsides, stony slopes; in lowlands and uplands throughout the Carpathians.

**1042. *Descurainia sophia* (L.) Webb. et Prantl, *Sisymbrium sophia* L.** – Annual, stems erect, 20-50 cm, branched above, minutely hirsute. **Seeds elliptic, apex rounded, base truncate, radicle as long as cotyledons, 0.8-1.1 x 0.5-0.7 mm. Surface bare lustrous, undulate, dark orange-brown. 2n = 28.** Native to western Asia, widespread in Eurasia, in waste places, roadsides, dwelling places; throughout the Carpathians.

**1043. *Cardaminopsis arenosa* (L.) Hayek, *Arabis arenosa* (L.) Scop., *Sisymbrium arenosum* L. Scop.** – Annual or biennial, 15-30 cm high, stems erect, a little flexuous, single, shortly hairy at the bottom. **Seeds elliptic or elliptic-oblong, flattish, apex narrowly winged, 0.8-1.2 x 0.6-0.8 mm. Surface undulate, orange-brown, membranous wing pale. 2n = 32.** Native to central and eastern Europe, on overgrown

slopes, rocks, embankments, sandy pastures, boundaries, forest borders. Hu, Mo, Ro, Sk, Uk.

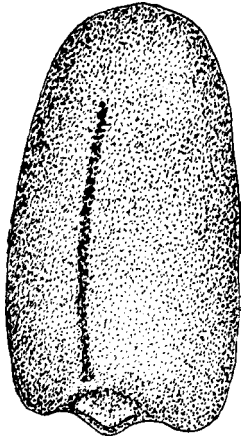
**1044. *Cardaminopsis borbasii* (Zapal.) Hess et al.** – Stems loosely hairy, flowers small, white. **Seeds elliptic-obovoid, flattish, radicle mostly longer than cotyledons, most part of the circumference narrow winged, 1.2-1.6 x 0.8-1 mm. Surface rugulose or papillose, orange-brown. 2n = 16, 32.** Native to the mountains of central Europe, on calcite and dolomite rocks. Sk.

**1045. *Cardaminopsis halleri* (L.) Hayek, *Arabis halleri* L.** – Perennial, 15-50 cm high, stems with a leaf rosette, ascendent or erect, mostly ramified. **Seeds elliptic or elliptic-obovoid, flattish, apex with a narrow wing, 0.9-1.3 x 0.7-0.8 mm. Surface fine undulate, slight lustrous, reddish-brown. 2n = 16.** Native to the mountains of central Europe, on meadows, pastures, riverbanks, roads. Ro, Sk, Uk.

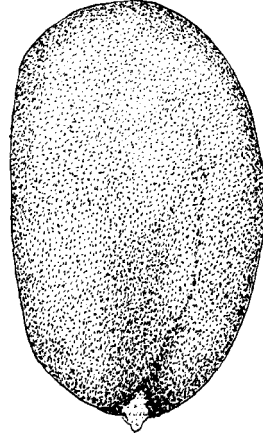
**1046. *Cardaminopsis hispida* (Mygind) Hayek, *C. petraea* (L.) Hill., *Arabis petraea* (L.) Lam.** – Perennial, 10-30 cm high, stems ascendent or erect, sometimes ramified, hirsute at the bottom. **Seeds elliptic-ovoid, flattish, apex winged, 1.4-1.6 x 0.7-0.9 mm. Surface undulate, glossy, dark-cinnamon. 2n = 16, 32.** Native to the Carpathians, on moist rocks and rock debris, stony places on calcareous and sandy foundations. Hu, Ro, Sk, Uk.

**1047. *Cardaminopsis neglecta* (Schult.) Hayek, *Arabis neglecta* Schult., *A. transsilvanica* Schur** – Perennial, 15-20 cm high, stems single or in tufts, mostly poorly ramified, glabrous. **Seeds elliptic to circular, apex usually on one side winged, 1-1.5 x 0.7-0.9 mm. Surface slight lustrous, fine undulate, hilum with white humplet yellowish-brown. 2n = 16, 32.** Native to the Alps and Carpathians, on wet rocks and screes, springheads. Ro, Sk, Uk.

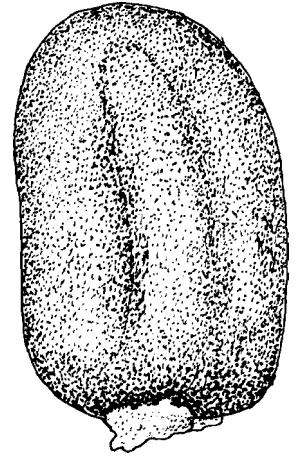
**1048. *Dentaria bulbifera* L., *Cardamine bulbifera* (L.) Crantz** – Perennial, 30-70 cm high, stems erect or ascendent, single, glabrous, brownish-violet, bulbils are in the axils of the leaves. **Seeds broad ellipsoid, with a expressive furrow on lateral sides, 3-4 x 1.2-1.6 mm. Surface longitudinal furrowed, lustreless, dark-greyish. Rich source for the multiplication are bulbils (left). 2n = 96.** Native to Europe and Asia Minor, in shady forests from uplands to the montane zones; in all countries of the Carpathians.



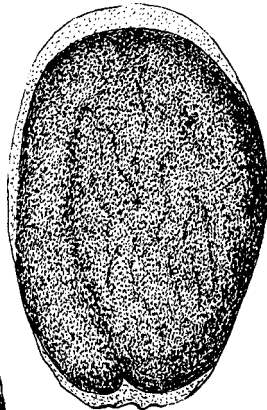
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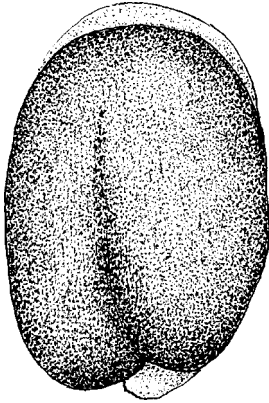
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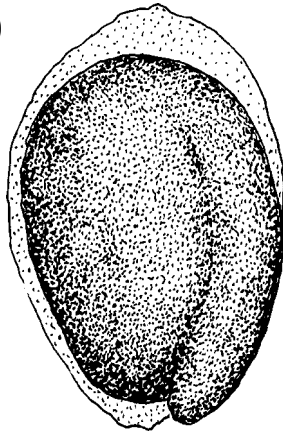
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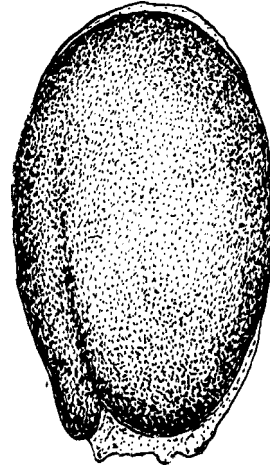
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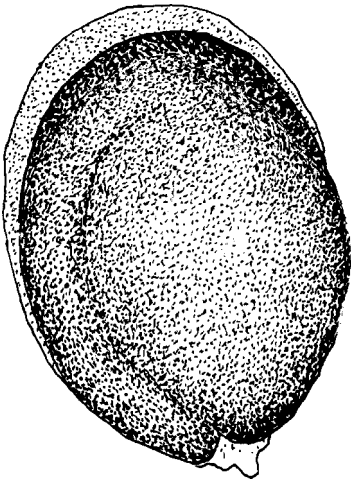
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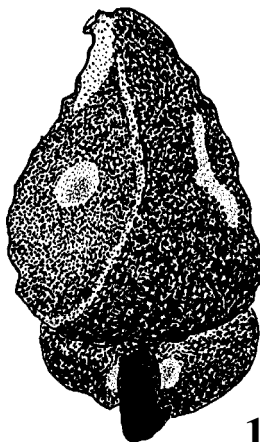
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**1049. *Dentaria enneaphyllos* L., *Cardamine enneaphyllos* (L.) Crantz** — Perennial, 18-30 cm high, stems from ascending base to erect, glabrous. **Seeds ovoid, flattish, radicle markedly longer than cotyledons, 2.6-3 x 1.2-1.5 mm. Surface lustrous, wrinkly to furrowed, yellowish- to red-brown. 2n = 80.** Native to central and southern Europe, from lowlands up to the montane zones, mostly in calcareous soil. Hu, Pl, Ro, Sk.

**1050. *Dentaria glandulosa* Waldst. et Kit., *Cardamine glandulifera* O. Schwarz** — Perennial, stems erect, glabrous, fleshy, unramified, 15-35 cm high. **Seeds obovoid, apex truncate or rounded, radicle indistinct but longer than the cotyledons, 2.6-3 x 1.5-1.8 mm. Surface lustrous, furrowed, dark-brown. 2n = 42, 48.** Originally growing in the Carpathians, in shady leafy forests, in stony, non-calcareous soils. Hu, Mo, Pl, Ro, Sk, Uk.

**1051. *Dentaria quinquefolia* M. Bieb.** — Perennial, stems ascending and erect, 20-40 cm high. **Seeds ellipsoid, apex roundish, bottom truncate, radicle indistinct, as long as cotyledons, 2.3-2.7 x 1.3-1.5 mm. Surface longitudinal furrowed, wrinkly, undulate, lustrous, yellowish-brown.** Native to eastern Europe, in shady, leafy woods. Br, Mo, Ro, Uk.

**1052. *Cardamine amara* L.** — Perennial, 20-60 cm, ± glabrous, rhizome non-roughened, stems on bottom hairy, from crawly base ascendent, on top branched. **Seeds elliptic, slight compressed, apex often excentric, base truncate, radicle as long as cotyledons, sometimes winged with narrow membrane or without it, 1.4-1.7 x 1.1-1.3 mm. Surface barely lustrous, fine undulate, reddish-brown. 2n = 32.** Native in Europe, on springheads, brookbanks, lowland forests, from lowland up to the montane zones; in all countries of the Carpathian region.

**1053. *Cardamine flexuosa* With., *C. sylvatica* Link., *C. umbrosa* Schur** — Annual to perennial, 20-50 cm high, stem ± erect, hirsute below, mostly ramified. **Seeds elliptic, elliptic-oblong, flattish, radicle longer than cotyledons, hilum with a narrow raphe, circumference with a dark-brown rim, 1-1.5 x 0.8-1 mm. Surface fine areolate, reticulate, orange-brown. 2n = 32 (-50).** Native to the Eurasian continent, in moister forests, riverbanks, plentiful in mountain areas. Br, Hu, Pl, Ro, Sk, Uk.

**1054. *Cardamine graeca* L., *C. longirostris* Janka, *Pteroneurum graecum* DC.** — Annual, stem simple or branched, 8-30 cm, glabrous or hirsute. **Seeds elliptic, lateral compressed, apex rounded with a narrow wing, base truncate, radicle indistinct, circumference with a dark-brown rim, 4-4.5 x 2.2-2.6 mm. Surface rugulose, reddish-brown. 2n = 16.** Native to southern Europe and western Asia, on shady rocks, forest borders, lawns. Ro, Uk.

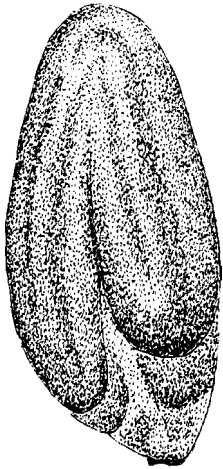
**1055. *Cardamine hirsuta* L.** — Annual (perennial), stems erect, simple or branched from the base, glabrous or dispersely hirsute. **Seeds elliptic, elliptic-oblong, apex rounded, base truncate, margin with a darker narrow rim, 0.8-1 x 0.6-0.8 mm. Surface fine undulate, orange to orange-brown, lustrous. 2n = 16.** Native to western and southern, at present to whole Europe, on moist forest meadows, weed in gardens and orchards; throughout the Carpathians.

**1056. *Cardamine impatiens* L.** — Annual to biennial, 20-80 cm high, stem erect, branched only on the top, richly leafy, glabrous, angular. **Seeds elliptic-oblong, apex rounded, base truncate, margin edged, wingless, with a darker rim, 1.2-1.5 x 0.7-0.9 mm. Surface fine undulate, glossy, orange-brown. 2n = 16.** An Eurasian plant, in moister places and riverbanks, overgrown rocks and rock debris; in all countries of the Carpathian territory.

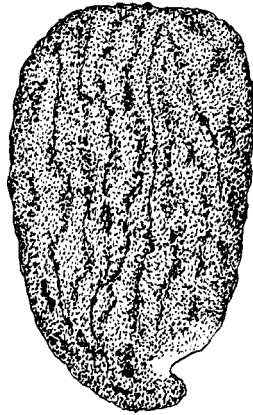
**1057. *Cardamine májovskyi* Marhold et Záborský** — Perennial, 20-40 cm high, branched from the base. **Seeds ellipsoid or ovoid, lateral compressed, apex roundish, bottom ± truncate, radicle as long as or a little longer than cotyledons, hilum with a pale raphe, 1.1-1.5 x 0.7-0.9 mm. Surface undulate, glossy, dark-brown. 2n = 32.** Native to lowlands of eastern Slovakia. Hu, Sk.

**1058. *Cardamine matthioli* Moretti, *C. hayneana* (Rchb.) Schur** — Perennial, 20-40 cm high, stems single or tufted, unbranched or branched only rarely. **Seeds elliptic, elliptic-ovoid, apex rounded, base truncate, radicle longer than cotyledons, wingless, 0.9-1.2 x 0.5-0.7 mm. Surface glossy, undulate, yellowish-brown. 2n = 16.** Endemic to central Europe and the northern Balkan Peninsula, in moist meadows and pastures of low- and uplands. Ro, Sk

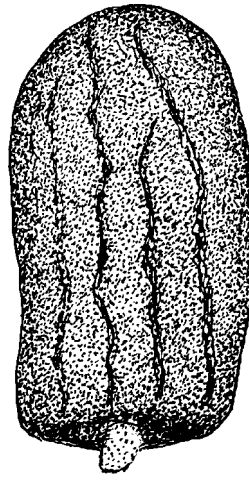
**1059. *Cardamine opizii* J. et C. Presl** — Perennial, stems simple, 10-60 cm high, rhizome roughened. **Seeds spherical or ellipsoid, lateral compressed, radicle as long as cotyledons, margin with a narrow**



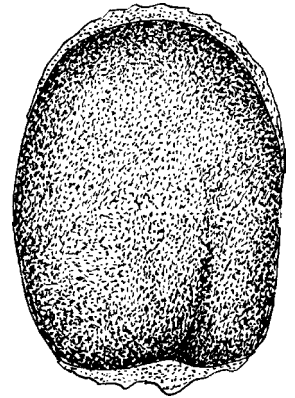
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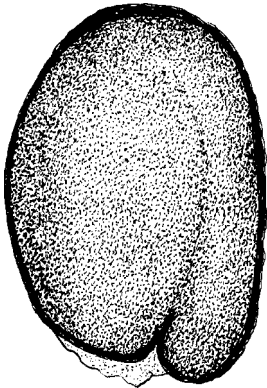
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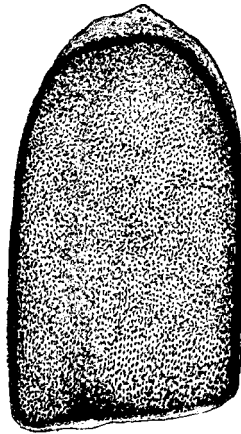
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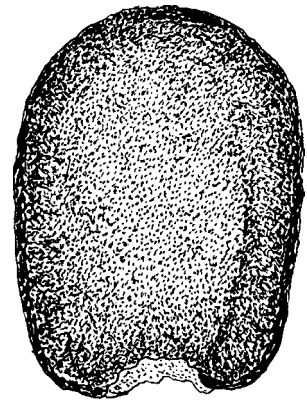
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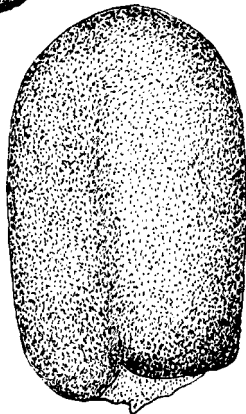
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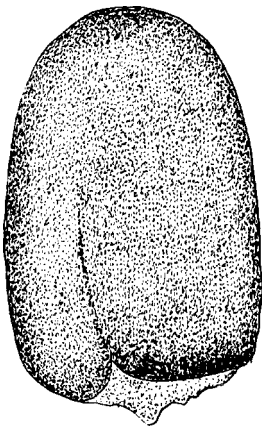
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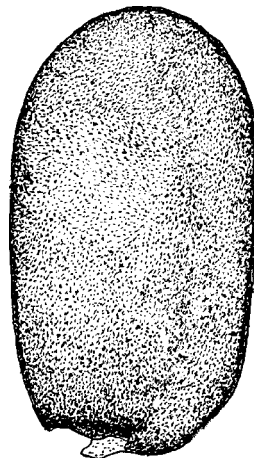
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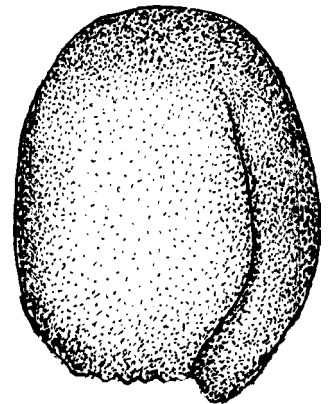
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hem, 1.2-1.4 x 0.9-1.1 mm. Surface faint undulate or smooth, slight lustrous, brown.  $2n = 32$ . Native to the Alps and Carpathians, on alpine planes, spring-heads, moist screes, torrent banks. Pl, Ro, Sk, Uk.

**1060. *Cardamine parviflora* L.** — Annual, stems erect, simple or ramified, angular, often undulate, 5-35 cm, glabrous. **Seeds elliptic, lateral compressed, apex rounded, base mostly truncate, margin edged, 0.6-0.8 x 0.5-0.7 mm. Surface barely lustrous, smooth or slight wrinkly, glossy, undulate, orange-brown.  $2n = 16$ .** Widespread in Europe, in moist, shady meadows, along pond and river borders, moist sandbanks. Br, Hu, Pl, Ro, Sk, Uk.

**1061. *Cardamine pratensis* L.** — Perennial, stems erect, mostly single, glabrous, hollow, 20-50 cm high. **Seeds elliptic-oblong or irregular, flattish, apex and base truncate, radicle slight longer than cotyledons, margin edged, 1.4-1.8 x 0.8-1.2 mm. Surface undulate, glossy, reddish-brown.  $2n = 16$  up to 48.** Widespread in Europe, in moist meadows, lowland forests, brooks, rivers, alluvial soils, from lowlands up to the subalpine zone; throughout the whole Carpathians.

**1062. *Cardamine resedifolia* L., *Arabis bellidioides* Lam.** — Perennial, 2-15 cm high, numerous stems erect, simple or branched. **Seeds circumpolar-quadrate, flattish, radicle and cotyledons equal in length, 1.2-1.4 x 0.9-1.1 mm. Surface undulate, lustrous, orange-brown.  $2n = 16$ .** Native to the mountains of central and southern Europe, on moist rock slits and rock debris, in siliceous and non-calcareous soils. Pl, Ro.

**1063. *Cardamine rivularis* Schur, *C. crassifolia* auct. non Pourr.** — Perennial, stems 20-45 cm high, little branched from the base. **Seeds ovoid, lateral compressed, radicle longer than cotyledons, 1.7-2 x 1.2-1.4 mm. Surface faint undulate, slight lustrous, greenish-brown.  $2n = 16$ .** Native to Europe, at spring-heads, wet screes and rocks. Cz, Ro, Uk.

**1064. *Cardamine trifolia* L.** — Perennial, 20-30 cm high, stems ascendent from crawly base,  $\pm$  without leaves. **Seeds elliptic, oblong-ovate, flattish, radicle longer than cotyledons and fair indistinct wingless, 2.4-2.8 x 1.2-1.5 mm. Surface wrinkly, green to yellow-brown.  $2n = 16$ .** Native to the Carpathians and the Balkan mountains, in humous forests, mostly in calcareous and stony soils. Hu, Pl, Sk, Uk.

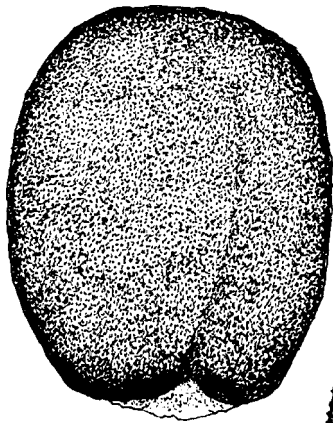
**1065. *Nasturtium microphyllum* (Boenn.) Rchb., *Rorippa microphylla* (Boenn.) Hyl.** — Perennial, like *N. officinalis* but flowers a little larger. **Seeds elliptic-circular to circular, radicle slight expressive, as long as cotyledons, 1-1.2 x 0.8-0.9 mm. Surface with very distinct areolate structure with more than 100 polygonal meshes on each side, slight lustrous, orange-brown.  $2n = 64$ .** Native mainly to western Europe, its distribution in eastern Europe is not yet known. Hu.

**1066. *Nasturtium officinale* R. Br., *N. fontanum* (Lam.) Asch.** — Perennial, stems hollow, ascendent from the crawly base, angular, glabrous, 20-90 cm, branched. **Seeds circular to elliptic-circular, flattish, radicle slight expressive, as long as cotyledons, 0.9-1.1 x 0.8-1 mm. Surface with a very marked areolate structure with more than 60 polygonal meshes on each side, slight lustrous, orange-brown.  $2n = 32$ .** Native to Europe and Asia, in proximity of brooks and springs, moist trenches and similar places in the whole Carpathians; rarely cultivated as a salad crop.

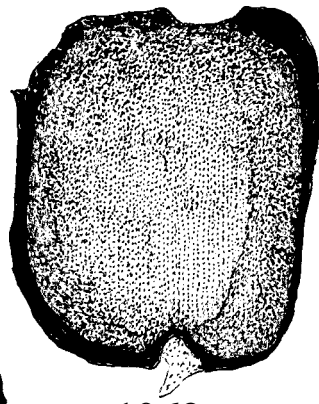
**1067. *Armoracia rusticana* P. Gaertn., B. Meyer et Scherb, *A. lapathifolia* Gilib.** — Perennial, robust, 50-150 cm high, stems erect, hollow, angular, branched on top. **Seeds elliptic-obovate, flattish, radicle a little longer than cotyledons, 1.6-2 x 1.2-1.5 mm. Surface rugulose, greyish-brown.  $2n = 32$ .** Probably native to southern Russia and the eastern Ukraine, on brooks banks, pastures, waste places; cultivated for culinary purposes, naturalized in most part of the Carpathians.

**1068. *Rorippa amphibia* (L.) Besser, *Sisymbrium amphibium* L.** — Perennial, stems ascendent, hollow, grooved, ramified, 40-100 cm high. **Seeds rounded, semi-elliptic or quite irregular, apex rounded, truncate or acute, margin thick on the cotyledonary part, compressed on the radicular part, rare with an apical wing, 0.8-1.2 x 0.6-0.8 mm. Surface distinct reticulate, meshes rounded, reddish-brown.  $2n = 32$ .** Native to most of Europe. Locally common in ponds, ditches and wet places; in the whole Carpathians.

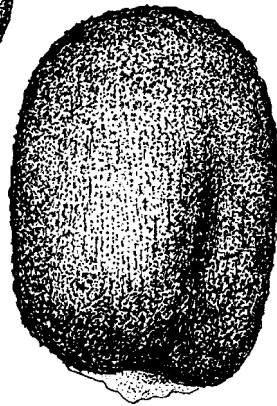
**1069. *Rorippa austriaca* (Crantz) Rchb., *Nasturtium austriacum* Crantz** — Perennial, 30-100 cm high, stems erect, mostly ramified, full. **Seeds irregular elliptic, strong compressed from sides, around the seed a narrow leathery whitish edge, 0.8-1 x 0.6-0.7 mm. Surface fine reticulate, dull,**



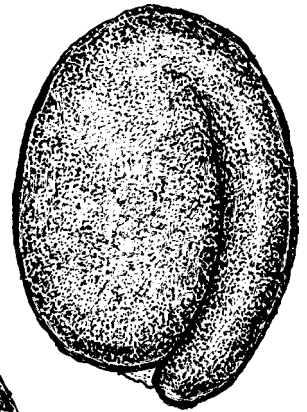
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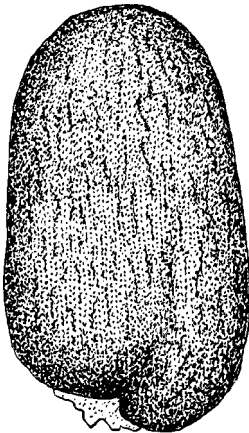
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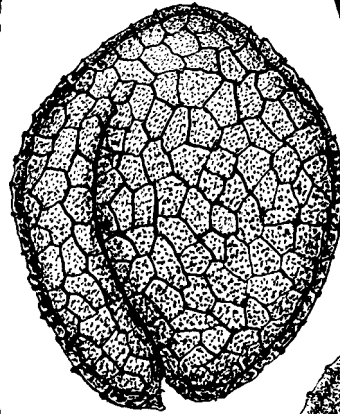
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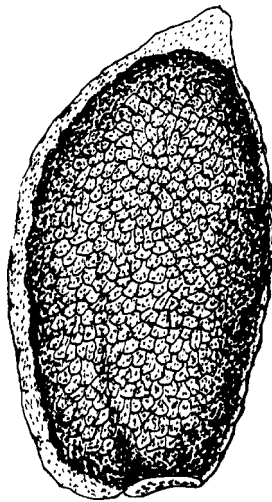
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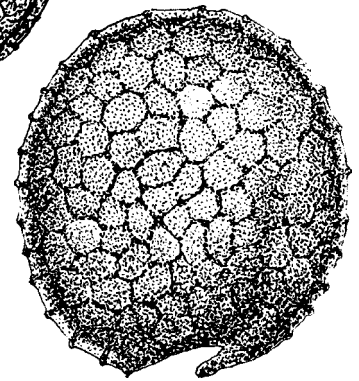
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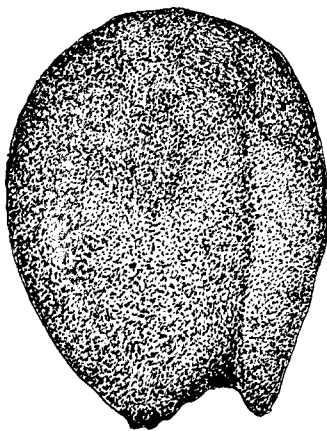
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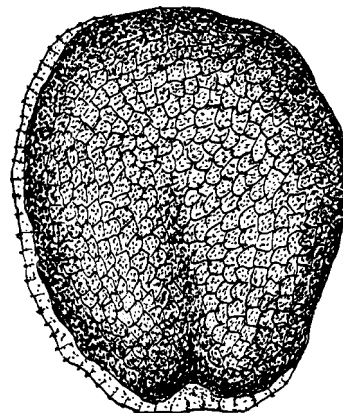
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1067



1069



**reddish-brown.  $2n = 16$ .** Native to eastern and central Europe, causal westwards, on fallows, riverbanks, roads, moist meadows of warmer areas; throughout the whole Carpathians.

**1070. *Rorippa palustris* (L.) Besser, *Nasturtium palustre* (L.) DC.** — Annual to perennial, stems  $\pm$  erect, hollow, angled, mostly branched, glabrous, scattered hirsute below. **Seeds obovate- or irregular-elliptic, radicle acute and as long as cotyledons, 0.7-0.8 x 0.5-0.6 mm. Surface bare lustrous, pustulate, buff-brown.  $2n = 32$ .** Native to Eurasia, now a cosmopolite of temperate zones, in moister places of riverbanks, lowland forests, fields and gardens. Br, Mo, Pl, Ro, Sk, Uk.

**1071. *Rorippa pyrenaica* (All.) Rchb., *R. stylosa* (Pers.) Mansf. et Rothm.** — Perennial, stems erect, branched only on the top, glabrous or shortly hirsute at base, 15-60 cm high. **Seeds elliptic-obovate, slight flattish, radicle shorter than cotyledons, 0.8-0.9 x 0.6-0.7 mm. Surface coarse reticulate, slight lustrous, reddish-brown, the net black.  $2n = 16$ .** Native to central and southern Europe, in dry meadows and pastures. Pl, Ro, Sk, Uk.

**1072. *Rorippa sylvestris* (L.) Besser, *Sisymbrium sylvestre* L.** — Perennial, 10-50 cm high, stems ascendent or erect, ramified, angular, glabrous or hirsute at the bottom. **Seeds irregular rounded or elliptic-obovate, radicle equal to or shorter than cotyledons, slight flattish, 0.5-0.7 x 0.4-0.5 mm. Surface fine reticulate, dark-brown.  $2n = 32, 48$ .** Native to temperate Eurasia, on marshes, swampy grounds, riverbanks, very rare in cultivated lands and meadows; in the whole Carpathians.

**1073. *Barbarea stricta* Andr., *B. adpressa* W. Mann ex Čelak.** — Biennial, stems erect, simple or branched, 60-100 cm, angular, glabrous. **Seeds oblong-elliptic, apex rounded, having angular appearance, base truncate, radicular furrow indistinct, 1.2-1.6 x 0.8-1 mm. Surface glabrous, longitudinal reticulate-foveate, greyish brown.  $2n = 16$ .** Originally growing in central, eastern and northern Europe, in moist meadows, riverbanks with over-flowed loamy soils; in the whole Carpathians.

**1074. *Barbarea verna* (Mill.) Ascherson** — Biennial, up to 75 cm high, glabrous or sparsely pubescent. **Seeds circular-quadrangle, lateral compressed, radicle indistinct, 1.7-2 x 1.4-1.6 mm. Surface distinct pustulate, lustreless, dark-greyish.** Native

to southwestern Europe; transiently introduced into the Carpathians, a weed in fields. Uk.

**1075. *Barbarea vulgaris* R. Br., *Erysimum barbarea* L.** — Biennial to perennial, stems erect, mostly branched, 30-100 cm, glabrous, angularly grooved. **Seeds elliptic-oblong or circular-quadrangle, cotyledonous part 1.5 to 3x wider than the radicular one, 1.4-2 x 1-1.4 mm. Surface rugulose, cotyledons accumbent, greyish-brown.  $2n = 16$ .** Originally throughout Europe, in moist places of forest roads, ditches, water banks, pastures, waste places; in the whole Carpathians.

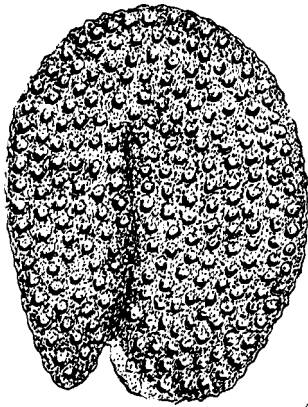
**1076. *Erysimum cheiranthoides* L.** — Annual, stems erect, simple or branched, angular, 20-50 cm, from 2-4-armed hairs pubescent. **Seeds semiconical, twisted conical or ovate-elliptic, base mostly truncate, apical wing diminutive or lacking, 1.4-1.8 x 0.6-0.9 mm. Surface glabrous, undulate, lustrous, orange-brown.  $2n = 16$ .** An Eurasian species, in weedy places, fields, river, sandy or gravel banks, preferring porous, moist, calciferous soils; in the whole Carpathians.

**1077. *Erysimum comatum* Pančić, *E. saxosum* Nyár., *E. banaticum* Jáv.** — Perennial, stems erect, up to 60 cm high, single, simple or branched above. **Seeds ovoid or pyramidal, lateral compressed, radicle  $\pm$  as long as cotyledons, apex with a short acute wing, hilum mostly with a black raphe, 1-1.8 x 0.5-0.6 mm. Surface minutely undulate, lustrous, orange-brown.** Native to the Balkan Peninsula, on mountain grassy and stony slants. Ro.

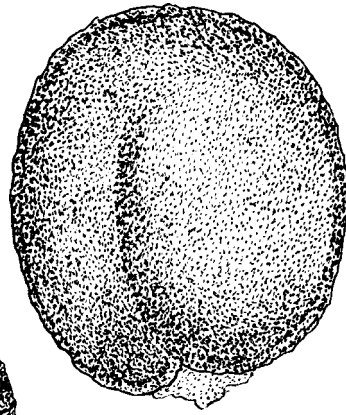
**1078. *Erysimum crepidifolium* Rchb., *E. cheiranthus* J. et C. Presl.** — Biennial to perennial, stems  $\pm$  erect, mostly simple, angular, 15-60 cm, from 2-armed hairs pubescent. **Seeds oblong-, obovate- or ovate-elliptic, radicle as long as cotyledons, wingless, 1.6-1.9 x 0.6-0.8 mm. Surface glabrous or undulate, slight lustrous, orange-brown.  $2n = 14$ .** Native to central and southeastern Europe, rare in rocks, rock debris, dry sunny slopes, roadsides, fields, from lowlands up to the montane zone.

**1079. *Erysimum cuspidatum* (M. Bieb.) DC., *Syrenia cuspidata* (M. Bieb.) Rchb.** — Annual to biennial, up to 70 cm high, hairs nearly all stellate. **Seeds ellipsoid, lateral compressed, apex rounded, bottom truncate with a blackish raphe, radicle as long as cotyledons, rare with a small wing, 1-1.5 x 0.7-0.9 mm. Surface undulate, lustrous,**

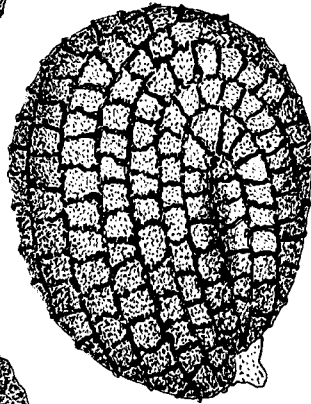




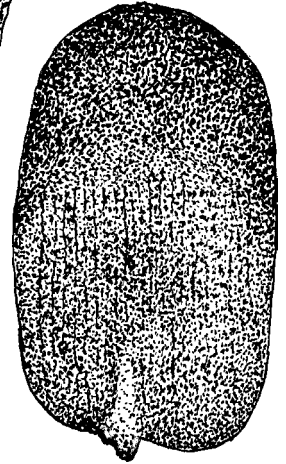
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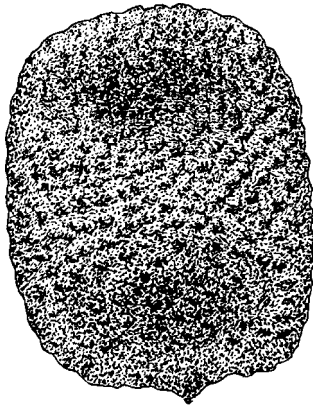
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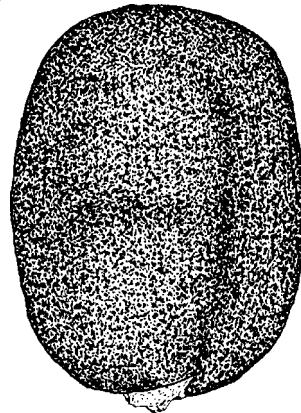
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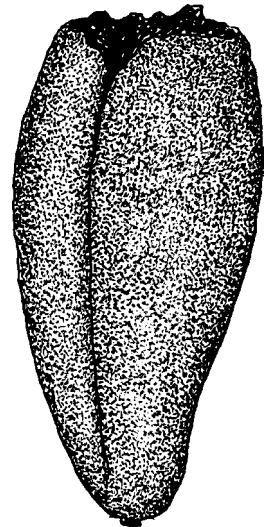
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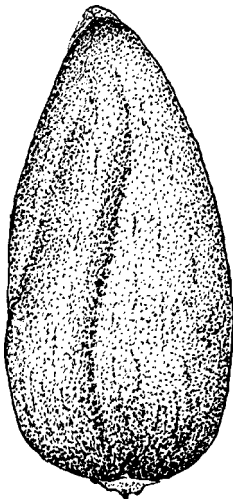
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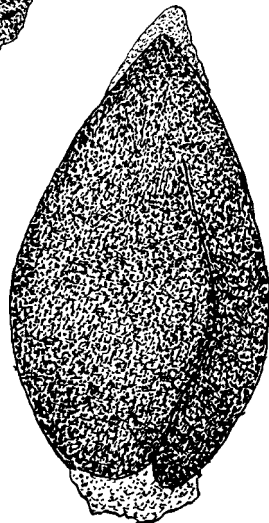
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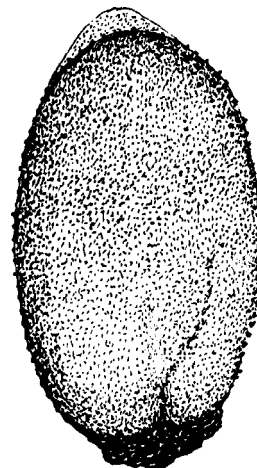
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1077



1079

**orange-brown.** Native to southeastern Europe, in grassy, stony, sunny places on woods, margins, ruderals, dry coasts, roadsides. Mo, Ro, Uk.

**1080. *Erysimum diffusum* Ehrh., *E. canescens* Roth** — Biennial to perennial, stems erect, simple or ramified, angular, 30-90 cm, from 2-armed greyish-green hairs pubescent. **Seeds elliptic-ovate or elliptic-oblong, apex rounded, radicle as long as cotyledons, 0.9-1.2 x 0.5-0.7 mm. Surface undulate, lustrous, yellowish-brown. 2n = 14, 28, 56.** Native to central and southeastern Europe, widespread in dry sandy, stony places, light shrubberies, alluvial calciferous and siliceous soils. Hu, Mo, Pl, Ro, Sk, Uk.

**1081. *Erysimum hieraciifolium* L., *E. strictum* P. Gaertn., B. Mey. et Scherb.** — Biennial, stems simple or branched from the base, stiff, weakly grooved, 50-90 cm, appressed hirsute. **Seeds oblong-ellipsoid, lateral flattish, apex rounded, with a membranous hem, bottom truncate, radicle as long as or a little longer than cotyledons, 1.2-2 x 0.7-0.9 mm. Surface fine granulate, rough at small papillae, faint lustrous, orange, orange-brown or pale-brown. 2n = 32.** Native to Eurasia, on overgrown rocks, debris, banks, roads, walls, meadows, from lowlands to the submontane zone, on anthropogenic stands. Hu, Mo, Pl, Ro, Sk, Uk.

**1082. *Erysimum hungaricum* Zapał., *E. wahlenbergii* (Asch. et Engl.) Borbás** — Perennial, stems erect, angular, loosely leafy, 40-100 cm high. **Seeds prolonged elliptic or ovate, apex with a wedge-shaped wing, radicle and cotyledons of the same length, 1.9-2.5 x 0.7-1 mm. Surface undulate, cinnamon-brown. 2n = 48.** Endemic to the Carpathians on rocks, stony and grassy slopes, on calcareous and dolomitic soils. Pl, Ro, Sk, Uk.

**1083. *Erysimum marschallianum* Andr. ex M. Bieb., *E. durum* J. et C. Presl, *E. hieracifolium* auct. non L.** — Biennial, stems bluntly angular, dense leafy, 15-60 cm high, leaves greyish, hirsute. **Seeds prolonged ovate or elliptic, radicle a little longer or the same as cotyledons, 1.4-1.8 x 0.6-0.8 mm. Surface undulate, lustrous, reddish-brown. 2n = 48.** Originally growing in western and central Europe, as far as the western Ukraine, on sunny steppe slopes, rocks and embankments, waste places, in warmer areas; in the whole Carpathians.

**1084. *Erysimum odoratum* Ehrh., *E. pannonicum* Crantz** — Biennial, stems erect, poorly ramified,

20-90 cm, dense leafy, hirsute. **Seeds prolonged obovate-elliptic, apex rounded, radicle longer than cotyledons, 1.6-2.4 x 0.9-1.1 mm. Surface fine undulate, glossy, rusty-brown. 2n = 32.** Native to central Europe, on sunny steppes, stony slopes and rocks, lightish leafy forests, shrubberies, in basic soils. Mo, Ro, Sk, Uk.

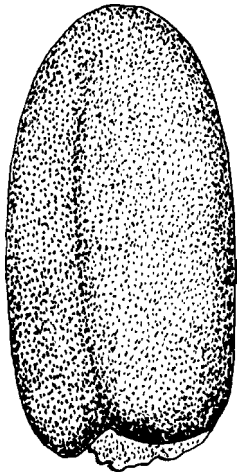
**1085. *Erysimum pallidiflorum* Jáv., *E. witmannii* subsp. *pallidiflorum* (Jáv) Dostál** — Biennial, stems erect, simple, 20-50 cm high, ground leaves whole-leaved or dentate, flowers pale greenish-yellow. **Seeds cylindric, lateral slight compressed, apex with membranous cup, bottom truncate, radicle as long as cotyledons, 1.8-2.2 x 0.7-0.8 mm. Surface slight lustrous, brown. 2n = 14.** Endemic to Pannonia, from upland to montane zones, on sunny, steppe slopes. Hu, Sk.

**1086. *Erysimum perofskianum* Fisch.** — Annual, 40-60 cm high, stems erect, hirsute. **Seeds prolonged elliptic, apex with a wedge-shaped wing, 2.3-2.7 x 1.2-1.4 mm. Surface fine undulate, lustrous, brown.** Originally growing in Afghanistan; in the Carpathians often cultivated in gardens as an ornamental summer-plant, uniquely naturalized.

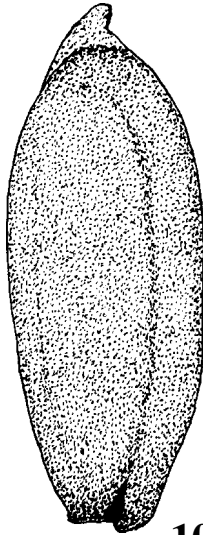
**1087. *Erysimum pieninicum* (Zapał.) Pawl.** — Biennial, stem slender, 50-120 cm high. **Seeds prolonged ellipsoid, slight compressed, apex with an acute wing, radicle as long as cotyledons, bottom truncate, 1.8-2.4 x 0.7-0.9 mm. Surface faint undulate, slight lustrous, reddish-brown. 2n = 48.** Endemic to the West Carpathians, on calcite rocks and walls. Pl.

**1088. *Erysimum repandum* L., *E. ramosissimum* Crantz** — Annual, stems erect, mostly branched, 15-50 cm, from 2-3-armed hairs pubescent. **Seeds oblong- or ovate-elliptic, flattish, radicle shorter or as long as cotyledons, 1.3-1.5 x 0.6-0.8 mm. Surface dull, glabrous, faint undulate, dark orange-brown. 2n = 14-16.** Native to the temperate zones of Europe and Asia, on dry, light sand-stony stands, waste grounds, shrubberies, in warmer areas; in the whole Carpathians.

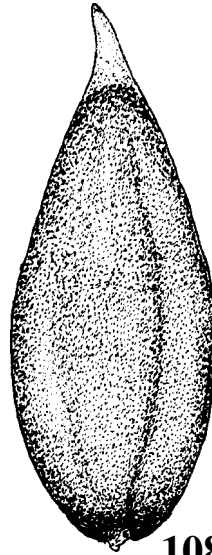
**1089. *Erysimum sylvestre* (Crantz) Scop.** — Perennial, caespitose, 10-30 cm high, from appressed hairs greyish-green, stems erect, rare branched, angular. **Seeds oblong ovoid or ellipsoid, lateral compressed, radicle as long as the cotyledons,**



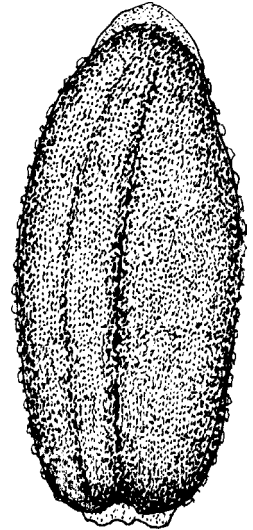
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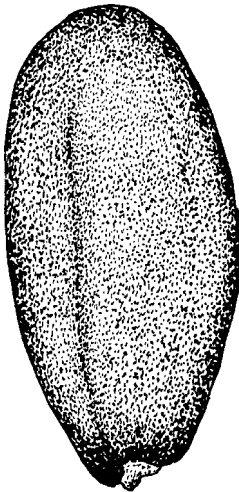
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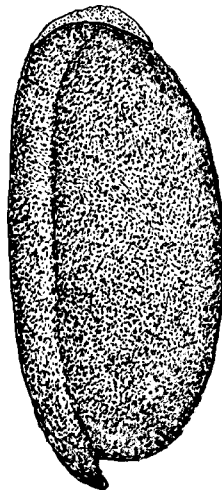
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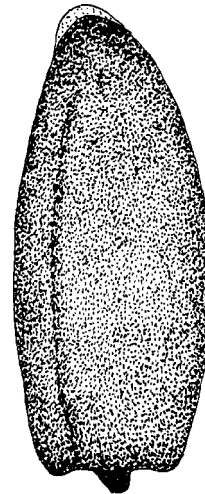
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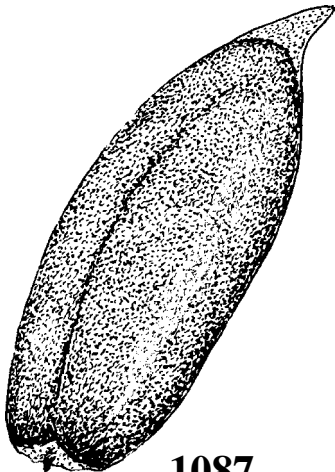
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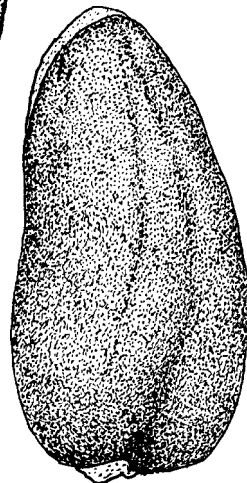
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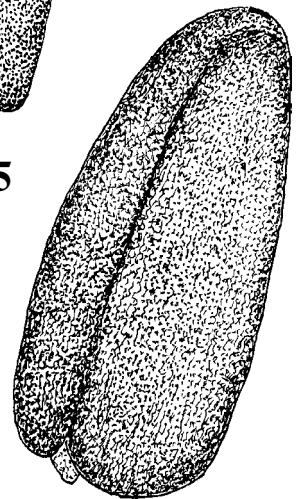
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**1.6-1.9 x 0.8-0.9 mm. Surface fine wrinkly, glossy, orange-brown.  $2n = 48$ .** Native to the Balkan Peninsula, on calcareous stones and screes; in the Carpathians only in the Poland (Pieniny mountains). Pl.

**1090. *Erysimum witmannii*** Zawadski – Biennial, stems erect, simple, 20-50 cm high. **Seeds elliptic-ovate, slight flattish, apex rounded, sometimes with a wing, radicle a little longer than cotyledons, 1.7-2.1 x 0.6-0.8 mm. Surface undulate, slight lustrous, dark- or orange-brown.  $2n = 14$ .** Endemic to the West Carpathians, on calcareous and dolomitic rocks, rock debris, pine forests, sunny, steppe slopes. Pl, Ro, Sk, Uk.

**1091. *Syrenia cana*** (Piller et Mitterp.) Neilr., *Erysimum angustifolium* Ehrh. – Biennial, stems erect, little ramified, 25-80 cm, from 2-armed hairs greyish-green. **Seeds elliptic-ovate, apex tapering into a small beak, radicle and cotyledons of the same length, 1.1-1.4 x 0.6-0.8 mm. Surface undulate, slight lustrous, orange-brown.  $2n = 14$ .** Native to the Pannonian region, in sandy soils of warmer areas. Hu, Pl, Ro, Sk, Uk.

**1092. *Sisymbrium altissimum*** L., *S. pannonicum* Jacq., *S. sinapistrum* Crantz – Annual to biennial, stem erect, leafy, 30-100 cm, branched, bristly, glabrous, hoary on the top. **Seeds elliptic-oblong, apex subtruncate, base truncate, radicle as long as cotyledons, 1-1.3 x 0.6-0.8 mm. Surface barely lustrous, with very fine striations, orange-brown.  $2n = 14$ .** Native to central and eastern Europe, often introduced elsewhere, on steppe stony slopes, pastures, waste places, fallows; in warmer area of the all Carpathian regions.

**1093. *Sisymbrium austriacum*** Jacq., *S. pyrenaicum* (L.) Vill. subsp. *austriacum* (Jacq.) Schinz et Thell. – Biennial, stems erect, branched from the base, 30-60 cm, dense leafy. **Seeds prolonged elliptic, flattish, apex winged, radicle as long as cotyledons, 1.4-1.7 x 0.6-0.7 mm. Surface undulate, slight lustrous, yellow-brown.  $2n = 14$ .** Native to central and southern Europe, on overgrown ruins, roadsides, rocks and stone-pits. Ro (?), Sk.

**1094. *Sisymbrium irio*** L., *Irio ruderalis* Fourr. – Annual, stems erect, softly downy or glabrous, 10-50 cm, weakly angular, branched only on the top. **Seeds elliptic-ovate, flattish, apex rounded on one side slanting, radicle longer than cotyledons,**

**1.1-1.5 x 0.6-0.7 mm. Surface lustrous, undulate, orange-brown.  $2n = 42$ .** Native to southern Europe, on roadsides and in waste places, fields, gardens, on sandy soils. Br, Pl, Ro, Sk, Uk.

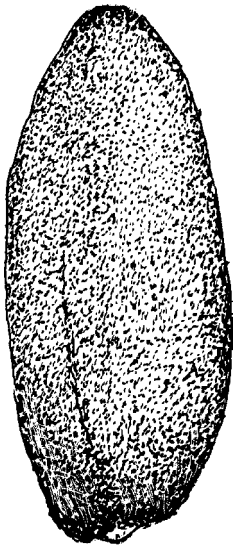
**1095. *Sisymbrium loeselii*** L., *Leptocarpaea loeselii* (L.) DC. – Annual or biennial, stem erect, 30-60 cm, dense leafy, ramified on the top, hirsute. **Seeds elliptic-oblong, apex rounded often oblique, base truncate, 0.7-0.9 x 0.5-0.6 mm. Surface high glossy, smooth to undulate, pale-brown.  $2n = 14$ .** Native to central and eastern Europe, on fallows, ruins, dumps, roadsides, ditches, fences, in warmer area; in the whole Carpathians.

**1096. *Sisymbrium officinale*** (L.) Scop. – Annual, stem erect, leafy, 30-60 cm, switchly ramified, bristly hirsute. **Seeds very variable, elliptic-oblong, circular-quadrate, apex rounded, truncate or oblique, base truncate, 1-1.5 x 0.7-0.9 mm. Surface barely lustrous, undulate, pale- or green-brown, olive-brown.  $2n = 14$ .** Native to western, central and southern Europe, as weed in fields, roadsides, gardens, dwelling-places; throughout Carpathians.

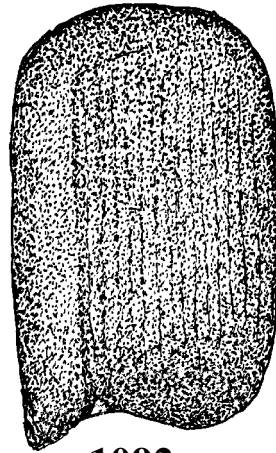
**1097. *Sisymbrium orientale*** L., *S. columnae* Jacq. – Annual to biennial, stem erect, 40-60 cm, softly hirsute at the bottom. **Seeds elliptic-oblong, apex rounded, radicle as long as cotyledons, 0.8-1.2 x 0.5-0.7 mm. Surface barely lustrous, undulate, orange-brown.  $2n = 14$ .** Native to the eastern Mediterranean, on roadsides, fields, dry slopes, steppes, embankments, vineyards. Hu Mo, Pl, Ro, Sk, Uk.

**1098. *Sisymbrium polymorphum*** (Murray) Roth, *S. junceum* (Willd.) M. Bieb., *Cheiranthus junceus* (Willd.) Waldst. et Kit. – Annual to perennial, stems glabrous, or hirsute below, 20-100 cm, erect, branched above. **Seeds polymorphous mostly angular, apex rounded or oblique with a beak, radicle longer than cotyledons, radicular furrow distinct, 1-1.5 x 0.8-1 mm. Surface undulate, orange-brown.** Native to eastern Europe, on steppe and stony slopes, in forests, river terrace, fields and ruderal stands; in all countries of the Carpathians.

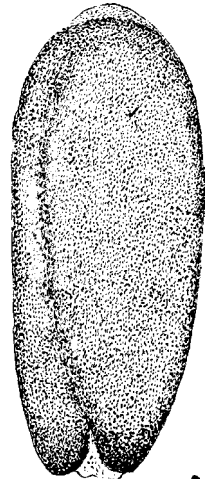
**1099. *Sisymbrium strictissimum*** L., *Hesperis strictissima* (L.) Kuntze – Perennial, stems erect, 50-150 cm high,  $\pm$  glabrous or hirsute, tufty branched above. **Seeds prolonged elliptic-ovate, apex with a beak, base truncate, 2.1-2.5 x 0.6-0.7 mm. Surface barely lustrous, undulate, rusty-brown.  $2n = 28$ .**



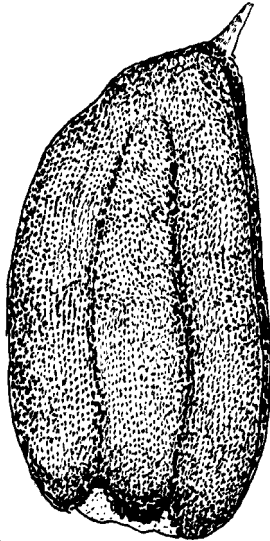
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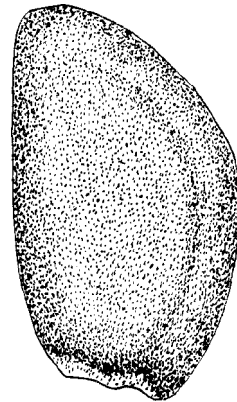
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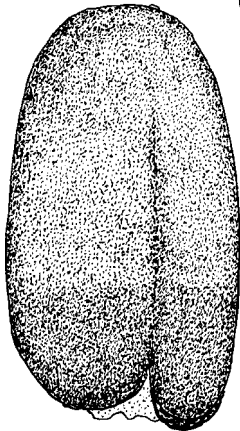
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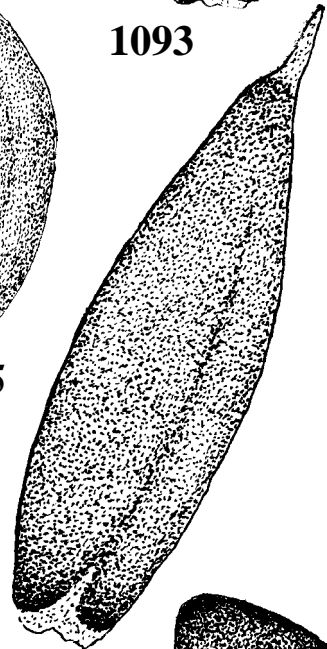
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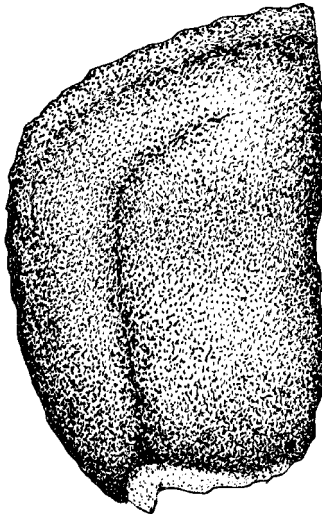
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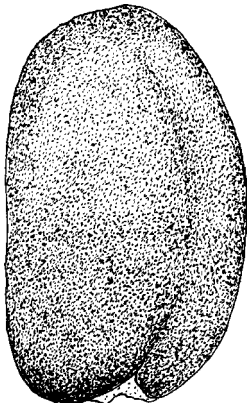
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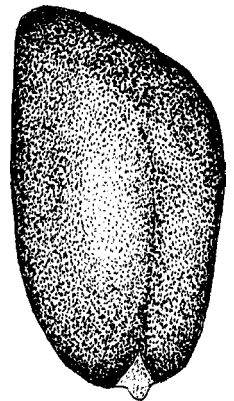
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Native to Europe, in shrubberies, forest borders, lowland forests, on driverbanks, overgrown slopes. Hu, Pl, Ro, Sk, Uk.

**1100. *Sisymbrium wolgensse*** M. Bieb. ex E. Fourn., *Hesperis volgensis* (M. Bieb. ex E. Fourn.) O. Kunze — Perennial, stem glabrous, branched, 20-100 cm, downy, hoary. **Seeds prolonged elliptic, apex rounded, oblique or with beak, base truncate, radicle longer than cotyledons, 2-2.5 x 0.8-1 mm. Surface undulate, barely lustrous, orange-brown. 2n = 14.** Native to eastern Europe, on railway embankments and stations, harbours, along roads, cereal stores, ruderal stands, dwellings, fields. Sk, Uk.

**1101. *Chamaeplium officinale*** (L.) Wallr. — Annual, stems erect, 20-50 cm, branched above, fine hirsute. **Seeds ellipsoid, lateral compressed, apex roundish, ± truncate or slanting, radicle as long as cotyledons, 1.3-1.6 x 0.7-0.9 mm. Surface smooth, slight lustrous, greyish-brown. 2n = 28.** Native to Eurasia, on secondary stands, roads, disturbed grounds, pastures, fallows, walls, riverbanks, in warmed up, sandy and loamy soils.

## 50. HYDRANGEACEAE

**1102. *Philadelphus coronarius*** L., *P. palidus* Hayek ex C. K. Schneid. — Shrub with numerous dark-brown twigs, about 1 to 3 m high. **Fruits capsulae, spindle- or comma-shaped, elliptic with a membranous apex, 2.3-3.3 x 0.6-0.7 mm. Surface longitudinal furrowed, slight lustrous, brown. 2n = 26.** Native to the Mediterranean, on warm slopes; in the Carpathians currently cultivated as an ornamental in gardens, parks and hedges, in numerous cvs.

**1103. *Philadelphus grandiflorus*** Willd., *P. gloriolus* Beadle — Shrub, up to 3 m high, leaves prolonged ovate, 4-7 cm long, dentate, flowers 4.5-5.5 cm in diam. **Fruits capsulae, spindleform with membranous apex, 3.3-3.8 x 0.7-0.8 mm. Surface longitudinal furrowed, faint lustrous, dark-brown.** Native to the USA; very favourite species cultivated in parks and gardens for ornament.

**1104. *Philadelphus inodorus*** L. — Shrub, up to 2-3 m high, young twigs brown, leaves whole-brim, ovoid. **Fruits capsulae, prolonged spindle-shaped with short membranous apex, 2.8-3.2 x 0.6-0.8 mm. Surface indistinct furrowed, dull or slight lustrous, yellowish-brown. 2n = 26.** Originally growing in North America, in scrubs or woodlands, on very warm

slopes; in Europe cultivated in parks and gardens as an ornamental.

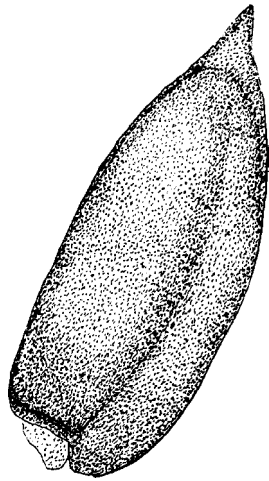
**1105. *Philadelphus latifolius*** Schrad., *P. pubescens* Loisel. — Shrub, young-twig bark yellowish-green, leaves reverse tomentose. **Fruits capsulae, prolonged spindle-shaped with longitudinal fine furrowed, cinnamon-brown. 2n = 26.** Native to North America; in the Carpathians seldom cultivated in gardens, and parks as an ornamental.

**1106. *Philadelphus microphyllus*** Gray — Shrub, up to 1.5 m high, leaves small, 0.5-2 cm, ovoid, whole-brim, flower single 2-2.5 cm in diam. **Fruits capsulae, tummy-like spindleform, apex membranous, mostly finger-shaped, 2.3-2.7 x 0.5-0.7 mm. Surface fine longitudinal furrowed, faint lustrous, rusty-brown.** Native to North America; in the Carpathians rarely cultivated in gardens and parks.

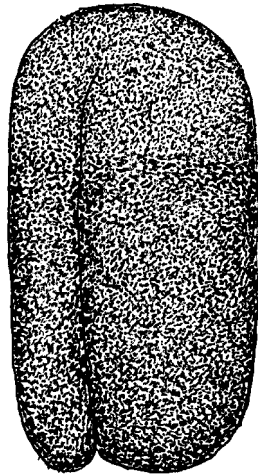
**1107. *Hydrangea arborescens*** L., *H. vulgaris* Michx. — Shrub, 1-3 m high, upright, mostly with barren, flowers. **Fruits capsulae, elliptic, enclosed in a membranous cover prolonged in base and apex, 2-2.5 x 0.4-0.5 mm. Surface covered with longitudinal veins, pale- or yellowish-brown. 2n = 36.** Originally growing in the Atlantic part of North America; in Europe cultivated in parks and town verdure as an ornamental.

**1108. *Hydrangea macrophylla*** (Thunb.) Ser., *H. hortensis* Sm., *H. japonica* Siebold — Shrub, up to 3 m high, flowers on the peaks of twigs. **Fruits capsulae, rounded or elliptic, enclosed in a membranous cover ended with beak on base and waved collar on the apex, 0.8-1 x 0.4-0.5 mm. Surface with a transparent membrane, reticulate, lustrous, pale-yellowish. 2n = 36.** Native to Japan and northern China; a very decorative shrub cultivated in numerous forms in parks and gardens, in warmer areas, in free nature, in greenhouses or in garden-plots.

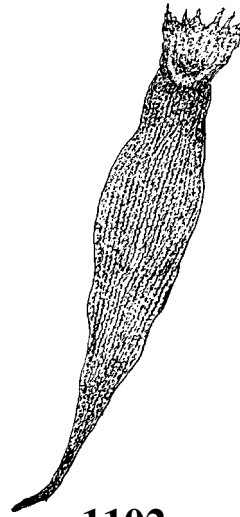
**1109. *Hydrangea paniculata*** Siebold — Shrub, up to 2 m high, with ovate, acuminate, serrate leaves. **Fruits capsulae, elliptic-oblong, enclosed in a membranous cover, 1.9-2.3 x 0.5-0.6 mm. Surface of the cover longitudinal veinous, transparent, yellowish-brown. 2n = 36.** Originally spread from Japan; introduced and rarely cultivated in parks. Flowers are mostly sterile.



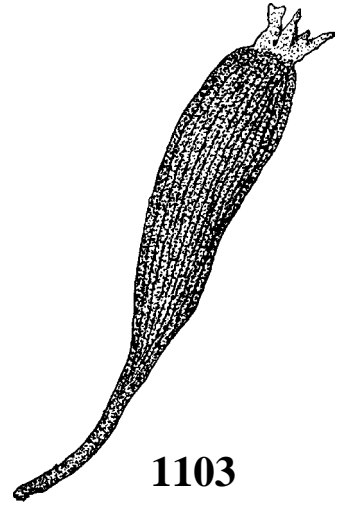
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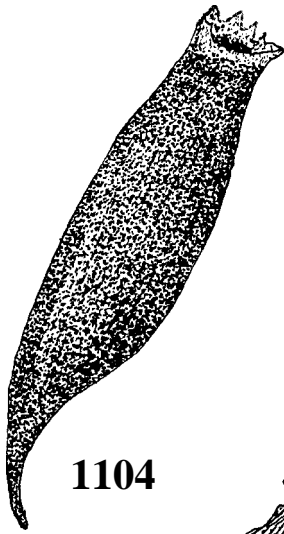
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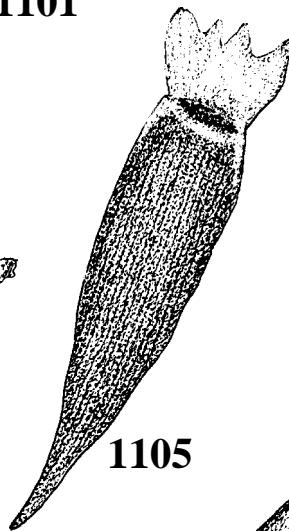
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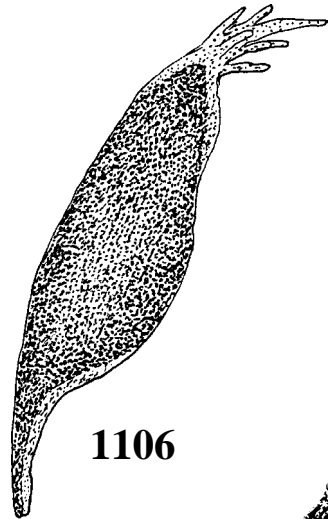
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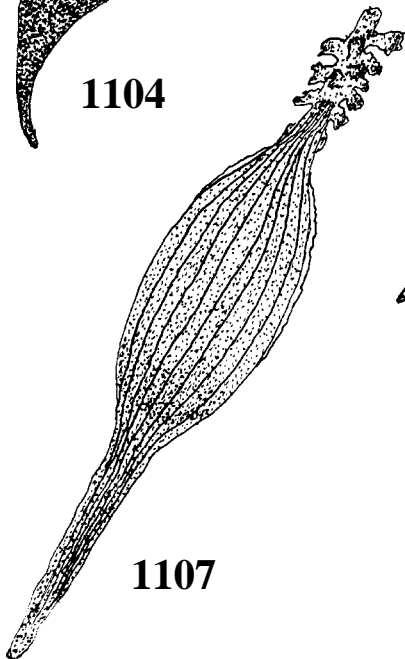
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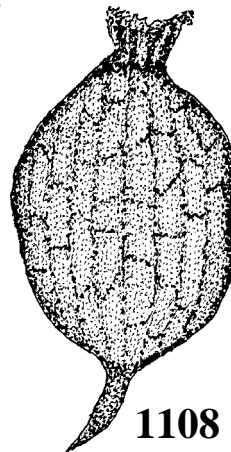
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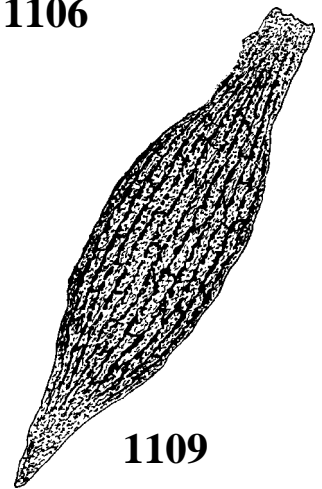
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**1110. *Hydrangea petiolaris*** Siebold et Zucc., *H. anomala* D. Don, *H. scandens* auct. non DC. — Twinning shrub fixed to the substratum by aerial rootlets, stems 20-25 m long. **Fruits capsulae, prolonged ovoid, lateral compressed, apex acuminate, bottom with an oval hilum, 0.5-0.8 x 0.2-0.3 mm. Surface longitudinal dense and shallow furrowed, glossy, reddish-brown. 2n = 36.** Native to Japan, rarely in parks of the Carpathians.

**1111. *Deutzia gracilis*** Siebold et. Zucc. — Shrub, up to 2 m high, leaves prolonged lanceolate, flowers white. **Fruits capsulae, spindle-like, elliptic, lateral compressed with membranous apex, 1.6-2 x 0.7-0.9 mm. Surface longitudinal reticulate, slight lustrous, dark-brown, membranous apex and bottom pale. 2n = 26.** Native to Japan, leaves of the form *aurea* Schelle are yellow; in Carpathians planted in parks as an ornamental.

**1112. *Deutzia scabra*** Thunb., *D. crenata* Siebold et Zucc. — Shrub, up to 1 m high, with ovoid up to ovoid-lanceolate leaves, white or reddish flowers. **Fruits capsulae, ellipsoid, with large membranous wings at both ends, 1.6-2 x 0.6-0.8 mm. Surface longitudinal grooved, lustrous, dark-brown, wings yellowish-brown. 2n = 130.** Originally growing in China and Japan, an ornamental shrub planted in parks, gardens and town verdure; locally naturalized in all Carpathian regions.

## 51. GROSSULARIACEAE

**1113. *Ribes alpinum*** L. — Shrub, up to 1.5 m high, twigs bare, light-grey, black-grey later on. **Seeds irregular shaped, mostly elliptic, ovate, obovate, circular, triangular, 2.5-3.2 x 2-2.6 mm. Surface wrinkly pitted, violet-carmin to black. 2n = 16.** Native to Europe up to the Caucasus, in rocky woods, on limestone, mountain streams, shrubberies; sometimes cultivated in hedge-rows; in all Carpathians territory.

**1114. *Ribes aureum*** Pursh — Shrub, 2-3 m high, twiglets in young stage glandulous downy, lustrous, grey-yellow later on. **Seeds irregular shaped, mostly elliptic to circular, 2-3 x 1.5-2 mm. Surface wrinkly, reddish- to violet-brown. 2n = 16.** Native to North America; in the Carpathians often cultivated in parks and orchards as a decorative species.

**1115. *Ribes cynosbati*** L., *Grossularia cynosbati* (L.) Mill. — Shrub, with tender thorns, twigs archedly crooked. **Seeds obovate, elliptic or oval, transversal**

**section ± spherical, 1.8-2.2 x 1.4-1.6 mm. Surface reticulate wrinkly with deep depressions, slight lustrous, dark-purple to black. 2n = 16.** Native to North America; parent species of some fruit cvs.

**1116. *Ribes divaricatum*** Dougl., *Grossularia divaricata* (Dougl.) Goville et Britt. — Shrub, up to 3 m high, with strong thorns, 1-2 cm long. **Seeds elliptic, apex acuminate, bottom roundish, dorsal side convex, ventral rooflike or flat, 2.8-3.2 x 1.3-1.5 mm. Surface longitudinal furrowed, slight lustrous, of dark-plum colour. 2n = 16.** Originally growing in North America; parent species of some fruit cvs.

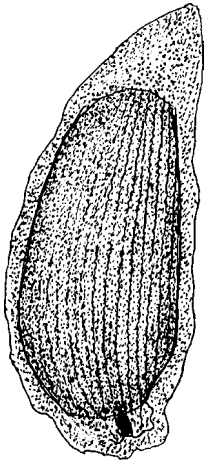
**1117. *Ribes lucidum*** Kit., *R. alpinum* L. subsp. *lucidum* (Kit.) Pawl. — Shrub, stems 60-150 cm, the young twigs first brown, then in the 2-nd year grey, leaves with glandular hairs above, bare below. **Seeds oval or rounded, lateral compressed, 2.3-2.7 x 1.8-2.2 mm. Surface humped, dull, violet-grey.** Carpathian endemic, in shrubby woods and overgrown rocks, of the subalpine zone, often cultivated in gardens and parks. Br, Uk.

**1118. *Ribes nigrum*** L., *R. olidum* Moench — Shrub, up to 2 m high, young twigs downy, glandular, later on brown-black. **Seeds elliptic-ovate, usually irregular, 2-2.7 x 1.1-1.5 mm. Surface dull or slight lustrous, roughen, dark purple-brown to black-brown. 2n = 16.** Native to central and eastern Europe, in wet woods, scrubs, lowland forests; in all Carpathians cultivated in orchards for fruits (Black Currants), with a high contents of vitamins.

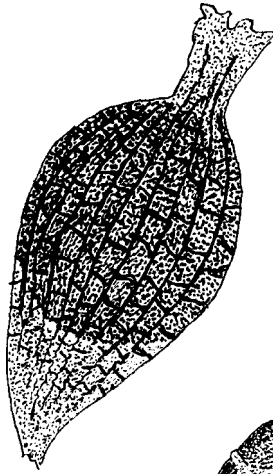
**1119. *Ribes odoratum*** H. L. Wendl., *R. fragrans* Lodd. — Shrub, up to 3 m high, fruits globular or elliptic, 7-10 mm, black. **Seeds ellipsoid, flat-tish, with hyaline ridges as a rest of gelatinous epidermis, 2.5-3 x 1.5-1.8 mm. Surface dull roughen, blackish, ridges orange.** Native to central North America, on scrubby slopes; in Europe cultivated as ornamental in parks and as undergrowth for tree gooseberry.

**1120. *Ribes petraeum*** Wulfen, *R. carpaticum* Kit. — Shrub, up to 3 m high, fruits dark-red, acid. **Seeds irregular, mostly obovoid with the rest of a gelatinous epidermis, 2-3 x 2-2.5 mm. Surface roughen, reddish-brown. 2n = 16.** Native to the mountains of central Europe, on moist shady forests, rocks, brook-banks, shrubberies. Probably one of the parents of *R. rubrum*. Hu, Pl, Ro, Sk, Uk.

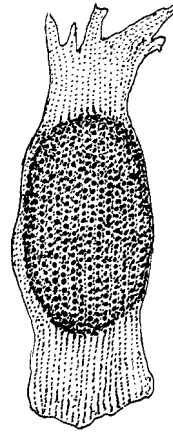




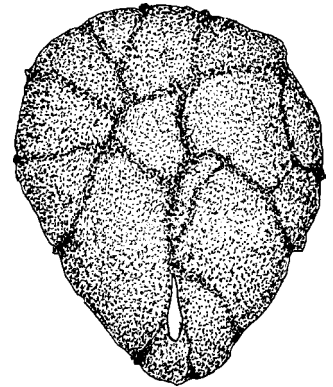
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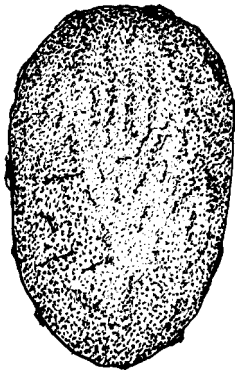
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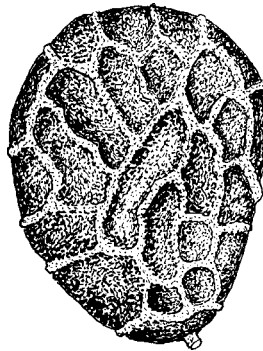
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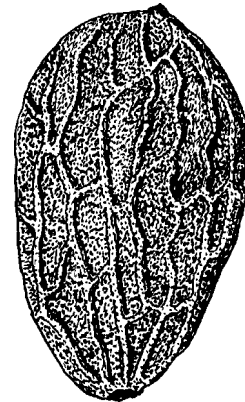
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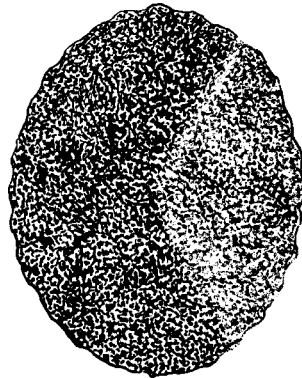
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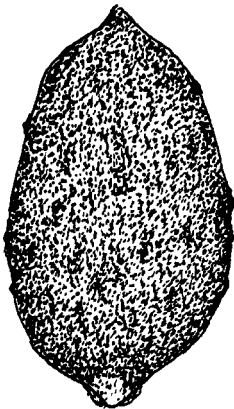
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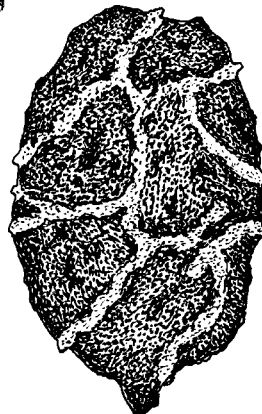
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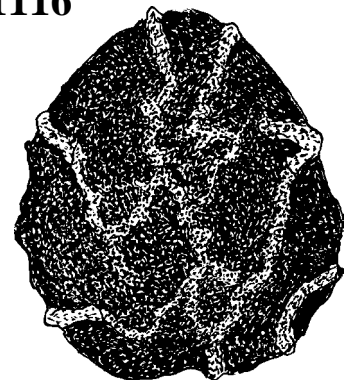
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**1121. *Ribes rubrum*** L., *R. domesticum* Jancz., *R. vulgare* Lam. — Shrub, 1-1.5 m high, young twigs grey, hirsute and glandular. **Seeds elliptic-obovoid, mostly irregular, base rounded, 2.4-2.8 x 1.5-2 mm. Surface roughen, slight lustrous or dull, dark-brown to blackish. 2n = 16.** Native to Eurasia, in lowland woods, brookbanks, on humous, sandy-loamy soils, mother species of many red- and white-fruitful cvs of commonly cultivated for palatable fruits (Currants) in orchards in a large extent; in all Carpathian region.

**1122. *Ribes sanguineum*** Pursh — Shrub, 2-3 m high, twiglets upright, reddish-brown, dark-brown later on. **Seeds elliptic-obovoid, mostly irregular, apex truncate, base rounded, 2.4-2.8 x 1.5-2 mm. Surface roughen, slight lustrous, black. 2n = 16.** Native to North America, semishady woody plant; in the Carpathians cultivated in many forms in orchards and parks as an ornamental shrub or treelet.

**1123. *Ribes spicatum*** Robson, *R. schlechtendalii* Lange — Shrub, 1-2 m high, young twigs downy, bald later on, berries 6-8 mm, red. **Seeds usually irregular, ellipsoid or obovoid, with rests of a gelatinous epidermis, 2.4-3 x 1.8-2.5 mm. Surface roughen, reddish-brown. 2n = 16.** Native to northern Europe, in coniferous forests shrubberies, riverbanks; one of the motherly species of the cultivated Red Currants. Hu, Ro, Sk, Uk.

**1124. *Ribes triste*** Pall., *R. albinervium* Michx. — Shrub, twigs procumbent, rooted out, ascendent, up to 75 cm high. **Seeds irregular shaped, mostly elliptic with one flat area, 2.5-3 x 1.8-2.2 mm. Surface roughen, faint lustrous, reddish-brown, sometimes with the rest of testa. 2n = 16.** Originally spread from eastern Asia and North America; in the Carpathians cultivated as one of the mother species of fruit cvs.

**1125. *Ribes uva-crispa*** L., *R. grossularia* L., *Grossularia uva-crispa* (L.) Mill. — Shrub, 60-150 cm high, freely and intricately branched, armed at the nodes with stout spines. **Seeds ovate or elliptic, on surface with the rest of testa, 2.5-3.6 x 1.5-2 mm. Surface wrinkly, dull or faint lustrous, dark-violet. 2n = 16.** Native to western, southern and central Europe, in wet thickets, hedges of forests, in chalky and nitrogenous soil; extensively cultivated for its palatable fruits (Gooseberries) in all Carpathian territories.

## 52. PARNASSIACEAE

**1126. *Parnassia palustris*** L. — Perennial, stems erect, simple, usually bearing a single sessile leaf, 5-40 cm high, glabrous, greyish-green. **Seeds saccate, flattish, apex and base obtuse, 1-1.4 x 0.4-0.6 mm. Surface dull, glabrous, reticulate, reticulum with low ribs, orange-brown. 2n = 18, 36.** Native to most of Europe, on wet meadows, stream banks, moors, screes, overgrown rocks, in the whole Carpathians.

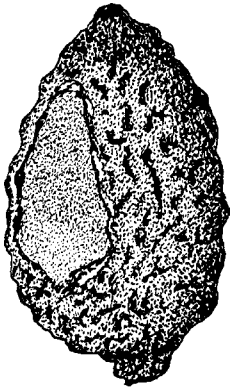
## 53. CRASSULACEAE

**1127. *Tillaea aquatica*** L., *Crassula aquatica* (L.) Schönl. — Annual, up to 2-6 cm high, stems decumbent, rooting. **Seeds obovoid with longitudinal furrows, apex rounded, base narrowed with a rounded hilum, 0.4-0.6 x 0.2-0.3 mm. Surface longitudinal furrowed, slight lustrous, brown. 2n = 42.** Native to northern and central Europe, on muddy and sandy pond margins, overflowing banks and shallow stagnant waters. Pl, Br, Sk.

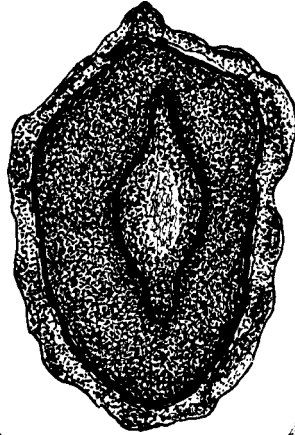
**1128. *Crassula rubens*** (L.) L., *Sedum rubens* L. — Annual, 5-15 cm high, stems erect, branched, leaves alternating. **Seeds elliptic obovate, transverse section circular, apex rounded, base confluent, obtuse, 0.4-0.6 x 0.2-0.3 mm. Surface longitudinal furrowed, slight lustrous, pale-brown. 2n = 40-42.** Native to southern Europe; rarely hauling into fields, vineyards, roadsides, rocks, in lowlands in sandy places only. Hu, Ro, Uk.

**1129. *Rhodiola rosea*** L., *Sedum rhodiola* DC., *S. roseum* (L.) Scop. — Perennial, 10-40 cm high, stems erect, unramified, dense leafy. **Seeds narrow obovoid, flattish, apex usually with a testal wing, 2-2.5 x 0.5-0.7 mm. Surface longitudinal ribbed, slight lustrous, dark purple-brown. 2n = 22.** Native to northern Europe, and in most of the mountains of central Europe, on calcareous rocks, in subalpine and alpine zones. Pl, Ro, Sk, Uk.

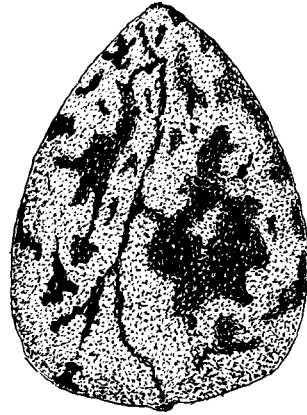
**1130. *Sedum acre*** L., *S. neglectum* Ten. — Perennial, flowering stems 5-12 cm, non-flowering short and dense leafy. **Seeds ellipsoid or pyriform, slight compressed, apex and base obtuse to papillate, with a testal wing at base, 0.6-0.8 x 0.3-0.4 mm. Surface longitudinal shallow ribbed, reticulate-areolate, yellowish-orange. 2n = 80.** Native to Eurasia, common in dry sandy grounds, walls, embankments, rocky screes, calcareous soils; in all Carpathian territory, often cultivated instead of lawns, on dry slopes with sterile soils.



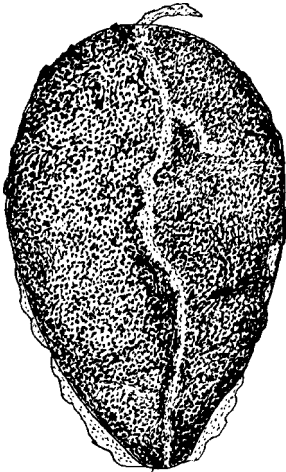
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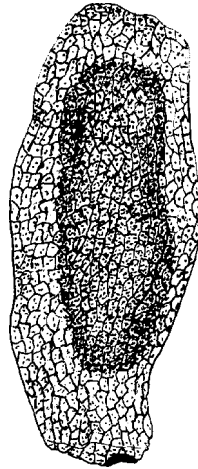
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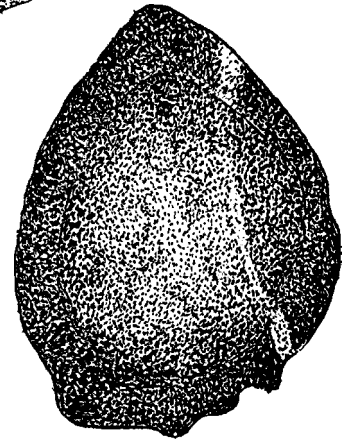
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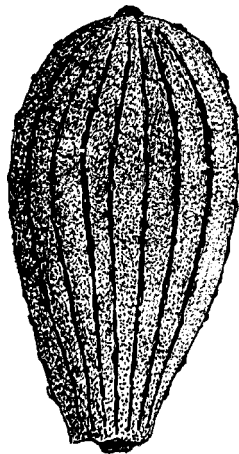
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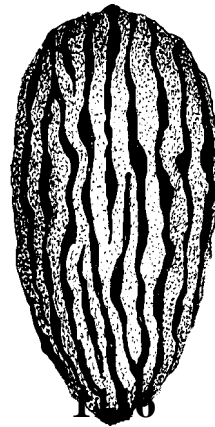
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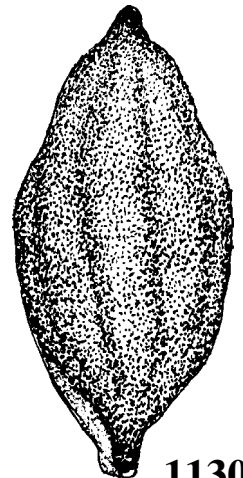
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**1131. *Sedum aizoon*** (L.) – Perennial, 30-40 cm high, stems single, branchless, erect, leafy. **Seeds prolonged obovoid, transversal section roundish, apex with a small beak, bottom truncate, with a narrow wing on the lateral side, 1-1.3 x 0.5-0.7 mm. Surface longitudinal furrowed, faint lustrous, brown. 2n = 128.** Native to eastern Asia, often cultivated in rock-gardens as an attractive ornamental, rarely naturalized. Hu.

**1132. *Sedum album*** L., *S. paniculatum* Kit., *S. micranthum* DC. – Perennial, pubescent, laxly caespitose, flowering stems scarcely leafy, 10-20 cm high, non-flowering dense leafy. **Seeds elliptic, slight flat-tish, apex and base obtuse to papillate, with the small testal wing, 0.7-0.9 x 0.2-0.3 mm. Surface longitudinal ribbed, orange-brown, transverse section broadly elliptic. 2n = 68.** Native to Europe, except the north and the east, on rocks, walls, roofs, stony slopes; often cultivated in gardens. Hu, Pl, Ro, Sk, Uk.

**1133. *Sedum alpestre*** Vill., *S. repens* Schleich., *S. saxatile* All. – Perennial, flowering stems 3-8 cm high, ascendent, non-flowering very short, both procumbent, rooting down. **Seeds elliptic-obovate, apex rounded with or without papilla and a wing, similar to the base, 0.6-0.7 x c. 0.3 mm. Surface shallow longitudinal ribbed, tuberculate, faint lustrous, pale-brown. 2n = 16.** Native to the mountains of central and southern Europe on rock slits, strong screes, snow deck-chairs. Pl, Ro, Sk, Uk.

**1134. *Sedum annuum*** L., *S. oederi* Retz. – Annual or biennial, tiny, glabrous, red-spotted, stems 4-12 cm high, ramified. **Seeds obovoid or obpyriform, without ribs or furrows, sometimes slight flat-tish, apex obtuse with a broad beak, narrowed below, 0.6-0.8 x 0.2-0.3 mm. Surface verrucose, dull, orange-red. 2n = 22, 44.** Native to the mountains of northern Europe, on sunny andesite rocks in alpine zone; sometimes grown in gardens for ornament. Pl, Ro, Sk, Uk.

**1135. *Sedum anopetalum*** DC., *S. ochroleucum* Chaix – Perennial, non-flowering up to 15-25 cm, procumbent, flowering stems 20-40 cm, ascending, woody below. **Seeds ellipsoid, apex rooflike, base narrowed into a hilum stump, 1.1-1.3 x 0.4-0.5 mm. Surface wrinkly, with numerous ribs, faint lustrous, dark-brown. 2n = 34, 68, 102.** Native to southern Eurasia, on stony, calcareous slopes;

in the Carpathians rarely cultivated in gardens for ornament. Ro.

**1136. *Sedum atratum*** L. – Annual, tiny, glabrous, 3-10 cm high, stems erect, leaves alternating. **Seeds obovoid, transversal section roundish, longitudinal ribbed, 0.6-0.8 x 0.2-0.3 mm. Surface tuberculate, faint lustrous, orange-brown. 2n = 16.** Native to the mountains of central and southern Europe, in subalpine and alpine zones, on calcareous foundations, rocks, rock slits, screes, brook-banks, Pl, Ro, Sk, Uk.

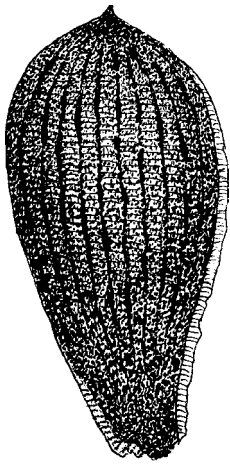
**1137. *Sedum cepaea*** L., *S. spathulatum* Waldst. et Kit. – Annual or biennial, up to 10-35 cm high, stems erect or ascending, simple or branched, glabrous, pubescent above. **Seeds ellipsoid, apex rounded with small beak, base truncate and throttled down, 0.4-0.6 x 0.2-0.3 mm. Surface glabrous, with numerous ribs, lustrous, reddish-brown. 2n = 20, 22.** Native to southern Eurasia, mainly in mountains, on stony slopes, arid scrubs. Ro.

**1138. *Sedum dasyphyllum*** L. – Perennial, up to 5-15 cm high, stems ascending or erect, glandular-pubescent above, branched. **Seeds prolonged obovoid or elliptic, apex rounded, base slight narrowed with hilum, 0.6-0.7 x 0.2-0.3 mm. Surface glabrous with 10-14 longitudinal ribs, slight lustrous, pale-brown. 2n = 28, 42, 56.** Native to southern and central Europe, in stony and near walls. Ro.

**1139. *Sedum forsteranum*** Sm., *S. elegans* Lej. – Perennial, stems ascending, sometimes with woody base, bare, 15-30 cm high. **Seeds oblong obovoid, apex with small corona, 1.1-1.3 x 0.4-0.5 mm. Surface longitudinal ribbed, transversal wrinkly, slight lustrous, brown.** Native to western Europe, very rarely cultivated in the Carpathians, in gardens as ornamental.

**1140. *Sedum hillebrandtii*** Fenzl, *S. sartorianum* subsp. *hillebrandtii* (Fenzl) D. A. Webb – Perennial, non-flowering leafy, shorter, flowering stems fewer leafy, 5-12 cm high, erect or ascending. **Seeds prolonged elliptic-obovate, apex obtuse, base truncate, 0.5-0.6 x 0.25-0.35 mm. Surface longitudinal ribbed, ribs crenate, reddish-brown. 2n = 64.** Native to the Danube Basin and the Balkan Peninsula, in sandy soils. Hu, Ro, Sk.

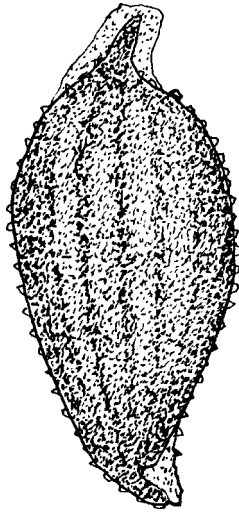
**1141. *Sedum hispanicum*** L., *S. glaucum* Waldst. et Kit., *S. hungaricum* Poir – Annual, sometimes biennial or perennial, glabrous or glandular downy,



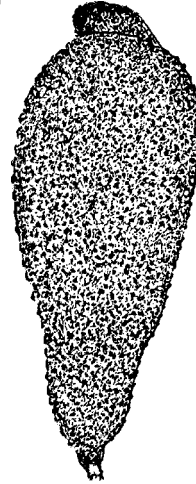
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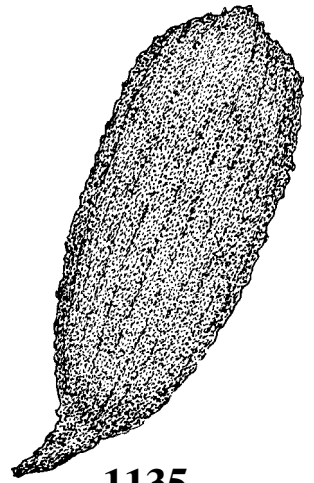
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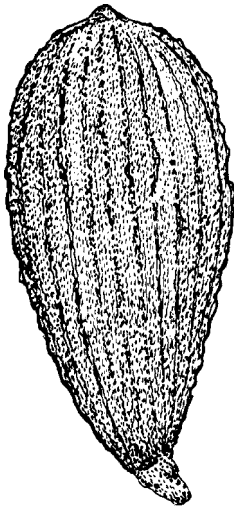
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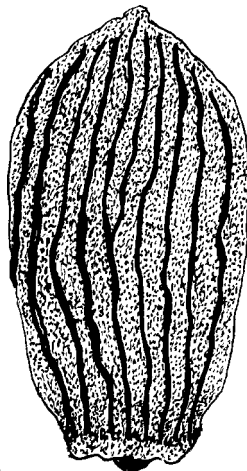
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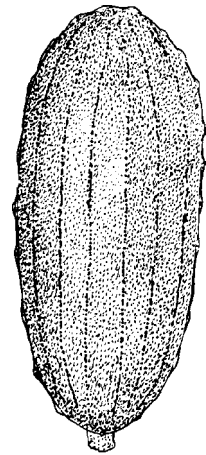
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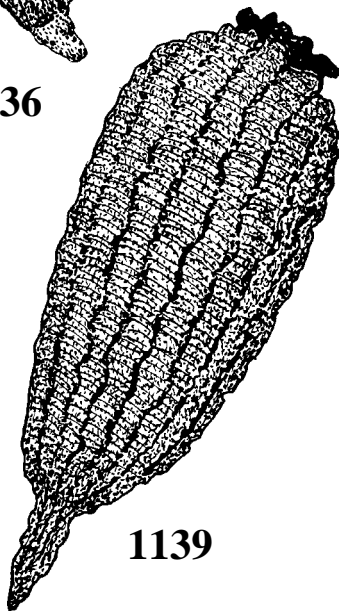
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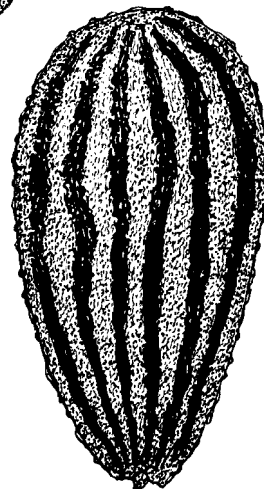
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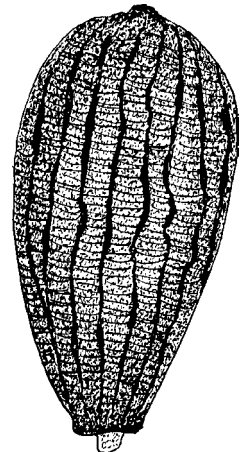
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5-15 cm high, stems ramified from the base, ascending. **Seeds elliptic-obovate, apex obtuse or papillate, base usually obtuse, 0.4-0.6 x 0.2-0.3 mm. Surface longitudinal ribbed, ribs crenate, barely lustrous, brown. 2n = 40.** Originally growing in southeastern Europe, on rocks, walls, roadsides, screes, limestone grounds. Hu, Pl, Ro, Uk.

**1142. *Sedum hybridum* L.** — Perennial, 15-20 cm high, flowering stems ascending, non-flowering stems short, leafy. **Seeds elliptic obovate, apex papillate, base truncate, 0.9-1 x 0.4-0.5 mm. Surface longitudinal ribbed, ribs crenate, barely lustrous, dark-brown. 2n = 64.** Native to northern Asia; sometimes cultivated in gardens, cemeteries instead of lawns.

**1143. *Sedum reflexum* L., *S. rupestre* L. p.p. subsp. *reflexum* Hegi ex E. Schmidt** — Perennial, stems sometimes creeping from woody base, ascending, non-flowering short, flowering 10-40 cm high. **Seeds prolonged obovoid, with small excrescences at the apex, bottom gradually narrowed, 1.1-1.5 x 0.4-0.5 mm. Surface ribbed longitudinal, wrinkly transversal, slight lustrous, pale-brown. 2n = 34, 68, c. 112.** Native to Europe, on dry, sunny rocks and slopes, sandbanks, light oak-woods; sometimes cultivated in rock-gardens. Hu, Pl, Ro, Sk, Uk.

**1144. *Sedum rupestre* L.** — Perennial, flowering stems 10-40 cm high, non-flowering short, both ascending. **Seeds prolonged elliptic-obovate, slight flattish, apex and base papillate, 0.9-1.5 x 0.4-0.5 mm. Surface longitudinal ribbed, ribs crenate with distinct transverse riblets, red-brown. 2n = 34, 68, 112.** Widespread in Eurasia, in sunny dry places, rocks, on stony and sandy slopes, walls, light forests, from lowlands to the subalpine zone; in the Carpathians rare cultivated in gardens.

**1145. *Sedum sarmentosum* Bunge** — Perennial, stems 8-10 cm high, with yellow or pink flowers. **Seeds ellipsoid, lateral compressed (convexo-concave), apex rounded, bottom narrowed and truncate, c. 0.6 x 0.25 mm. Surface longitudinal dense ribbed, lustrous, yellowish-brown.** Originally spread from Chile, a mountain species; introduced into the Carpathians and cultivated in gardening as a carpet plant, in cemeteries etc.

**1146. *Sedum sexangulare* L., *S. boloniense* Loisel, *S. mite* Gilib.** — Perennial, flowering stems 6-15 cm high, non-flowering, dense leafy, shorter, laxly caespitose. **Seeds prolonged elliptic-obovate, apex obtuse**

**to papillate, 0.5-0.7 x 0.2-0.3 mm. Surface tuberculate or faint-areolate, brown. 2n = 74.** Native to central Europe, in sandy and stony places, on rocks, dry and semidry turf, walls and embankments; in all Carpathian territories; often cultivated instead of grass-lawns.

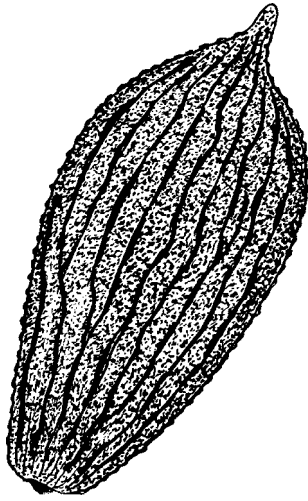
**1147. *Sedum spurium* M. Bieb., *S. oppositifolium* Sims** — Perennial, 10-20 cm high, tufted, flowering stems ascending, non-flowering procumbent, shorter. **Seeds obpyriform or obovoid, with a usually wing-like hyaline raphe, 0.9-1.2 x 0.4-0.6 mm. Surface markedly longitudinal ribbed, dark-brown. 2n = 28.** Native to the Caucasus; cultivated in rock-gardens, cemeteries, embankments, naturalized in many parts of the Carpathians.

**1148. *Sedum villosum* L.** — Biennial or perennial, 10-20 cm high, glandular downy, stems procumbent or ascendent, branched at base. **Seeds prolonged obovoid, apex usually with a hyaline beak, base usually truncate, 0.6-0.9 x 0.3-0.4 mm. Surface longitudinal ribbed, yellowish or light-brown. 2n = 30.** Native to central Europe, scattered in moist-humous stands, meadows, ditches, peat-bays, saline soils. Br, Pl, Ro, Uk.

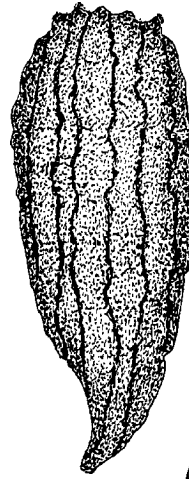
**1149. *Hylotelephium argutum* (Haw.) Holub., *Sedum carpaticum* G. Reuss, *S. fabaria* subsp. *carpaticum* (G. Reuss) Dostál** — Perennial, flowering stems 20-50 cm high, leaves lanceolate, acuminate. **Seeds obovate, apex papillate with narrow wing, 1.3-1.5 x 0.4-0.5 mm. Surface longitudinal ribbed, slight rugulose, orange-brown. 2n = 24.** A Carpathian endemic, in mountain planes, stony, non-calcareous, humous, shallow soils; cultivated in gardens as a beautiful ornamental plant (flowers purplish-red or lilac). Pl, Ro, Sk, Uk.

**1150. *Hylotelephium maximum* (L.) Holub, *Sedum maximum* (L.) Hoffm., *S. latifolium* Bertol.** — Perennial, up to 20-70 cm high, stems erect, rarely ascending, simple or branched above, glabrous. **Seeds prolonged ovoid, with a narrowed apex and a base, 1.3-1.5 x 0.3-0.5 mm. Surface wrinkly with numerous longitudinal furrows and ribs, lustrous, brown. 2n = 24.** Native to western Europe, but locally growing in deciduous forests, shrubberies, rocks, screes, stony slopes and soils. Br, Hu, Mo, Pl, Ro, Sk.

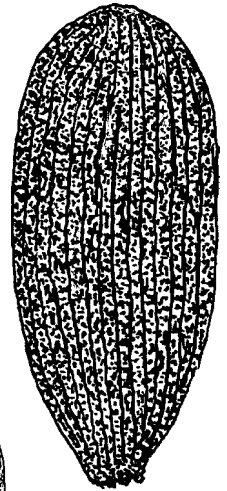
**1151. *Hylotelephium spectabile* (Boreau) Ohba., *Sedum spectabile* Boreau** — Perennial, stems 20-40 cm



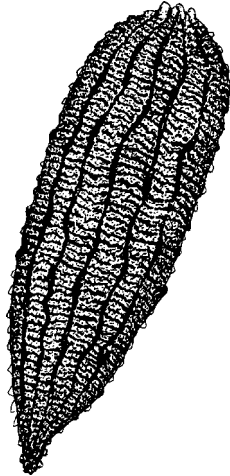
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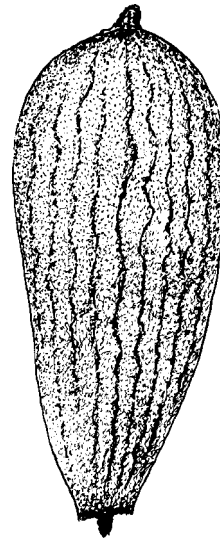
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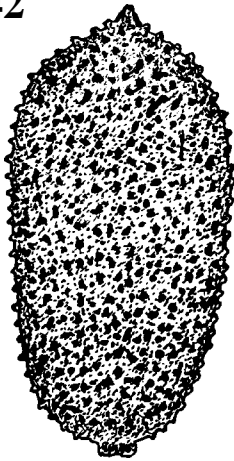
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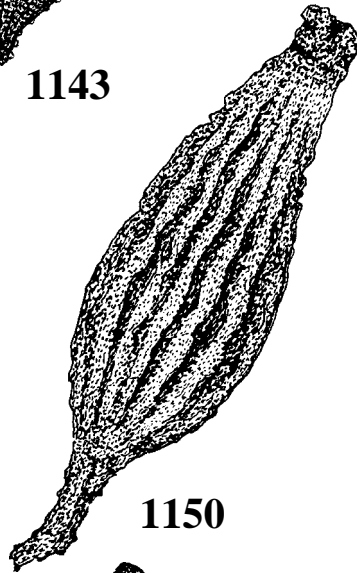
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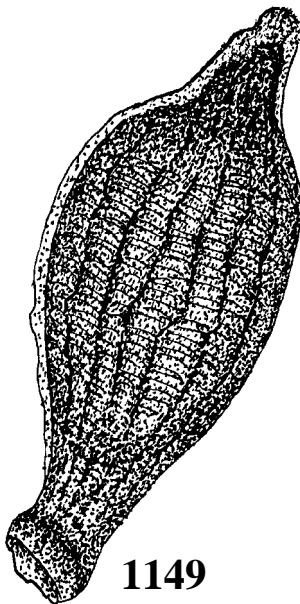
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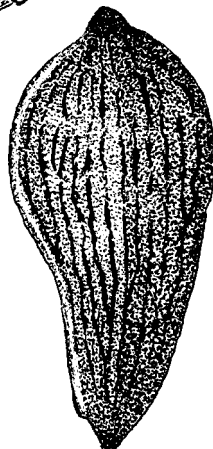
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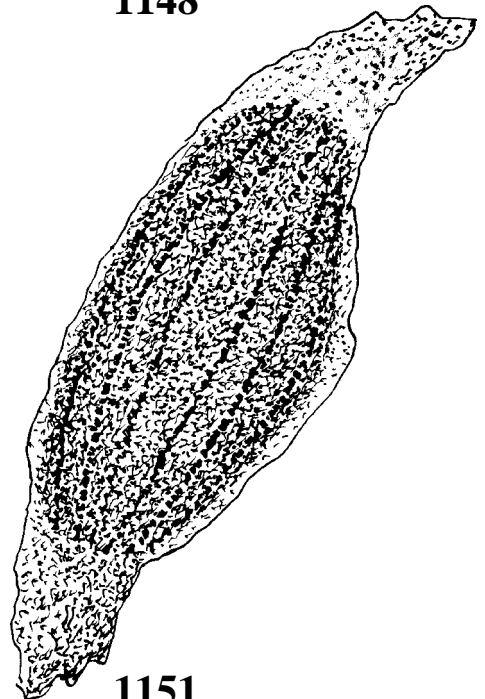
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high, sturdy vigorous. **Seeds  $\pm$  spindleform, apex and bottom narrowed, slight compressed, 1.1-1.4 x 0.4-0.5 mm. Surface longitudinal ribbed, slight lustrous, brown.** A plant cultivated since ancient times in China and Japan; in the Carpathians cultivated in gardens, mostly in flower-beds.

**1152. *Hylotelephium telephium*** Ohba., *Sedum telephium* L., *S. purpurascens* Koch, *S. purpureum* (L.) Schult. — Perennial, robust, 20-80 cm high, stems erect or ascending, simple, glabrous. **Seeds narrowly obovoid, slight flattish, base usually with a distinct testa tail or wing, 0.9-1.4 x 0.3-0.5 mm. Surface lustrous, longitudinal ribbed, ribs crenate, narrow, distinct, pale-brown.  $2n = 48$ .** Native to central and southern Europe, in light mountain forests, stony soils rich in nutrients, shrubberies, clearings, waste grounds, meadows. Br, Mo, Pl, Ro, Uk.

**1153. *Sempervivum arachnoideum*** L. — Perennial, leaves rosettes small, compact, crowded, more or less covered above by an arachnoid veil of long, flexuous interwoven hairs. **Seeds prolonged obovoid, with a small wing on the apex, base narrowed with hilum, 0.7-0.8 x 0.2-0.3 mm. Surface with longitudinal ribs, lustrous, yellowish-brown.** Native to the mountains of the western Europe; in the Carpathians only very local and rare (Sk), or cultivated in rock-gardens and flowerpots.

**1154. *Sempervivum matricum*** Letz., *S. marmoreum* auct. non Griseb., *S. schlehanii* auct. non Schott — Perennial, ground rosettes open, 6-10 cm diam, stems in flowering time 10-25 cm high. **Seeds prolonged obovoid to obpyriform, barely flattish and winged, with a small beak on the apex, base usually apiculate, 0.8-1 x 0.3-0.5 mm. Surface longitudinal ribbed, ribs faint crenate with indistinct transverse ribs, orange to orange-brown.  $2n = 34$ .** Native to the Balkan Peninsula on sunny rocks, calcareous rocky soils. Pl, Ro, Sk.

**1155. *Sempervivum ruthenicum*** Schnittsp. et C. B. Lehm., *S. zeleborii* Shott — Perennial, stems sulcate of 20-35 cm, glandular-pubescent. **Seeds obpyriform, with or without a membranous wing on the apex, base narrowed with hilum, 0.8-1 x 0.4-0.5 mm. Surface with numerous longitudinal ribs, slight lustrous, pale-brown.  $2n = 64$ .** Native to southeastern Europe, in dry calcareous places, sands, rocks, pine-woods, mainly in uplands and lowlands. Br, Mo, Pl, Ro, Uk.

**1156. *Sempervivum tectorum*** L., *S. assimile* Schott — Perennial, ground rosette open, large, shoots leafy, flowering stems up to 60 cm high. **Seeds prolonged obpyriform or obovoid, flattish, apex rounded, base with or without wing or tail, 0.9-1.2 x 0.4-0.6 mm. Surface longitudinal ribbed, ribs faint crenate, interspaces with indistinct transverse ribs, orange-brown.  $2n = 36, 72$ .** Native to central and southern Europe; cultivated on the roofs of cottages and stone-walls. Br, Hu, Pl, Ro, Sk, Uk.

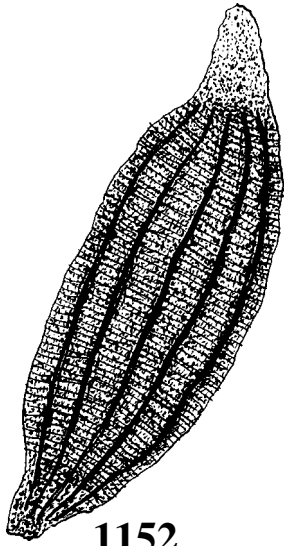
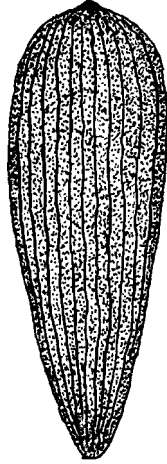
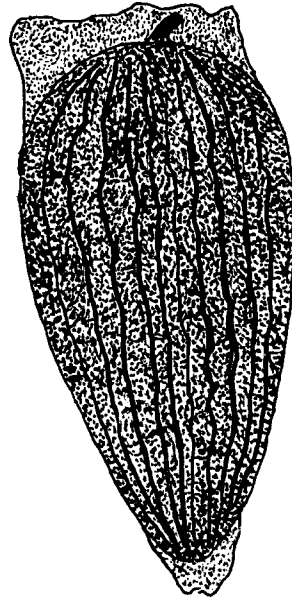
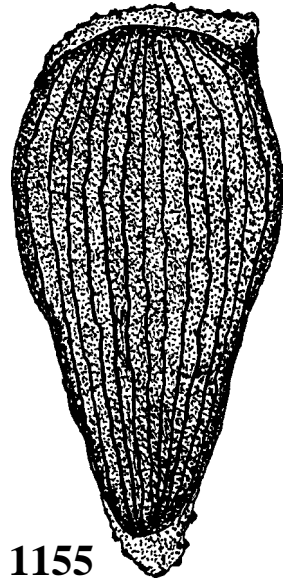
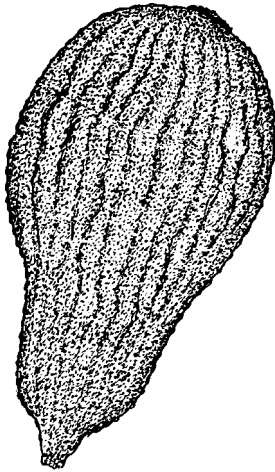
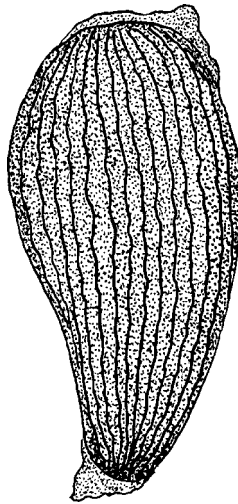
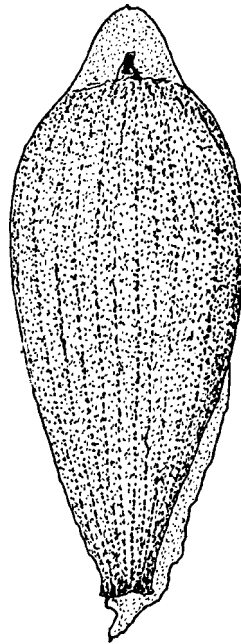
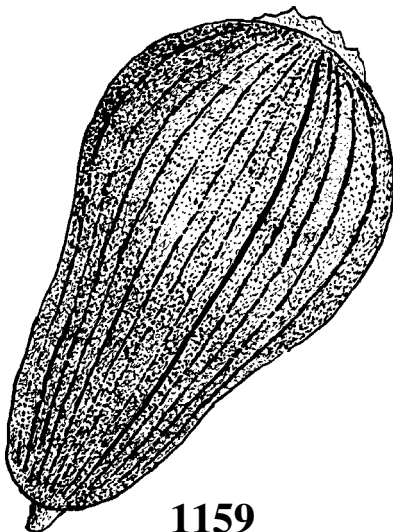
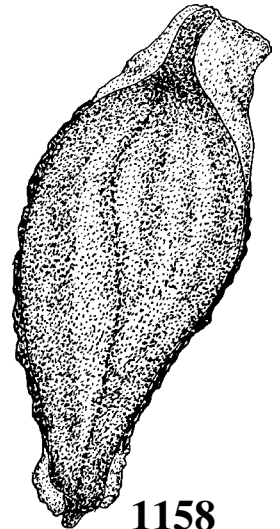
**1157. *Sempervivum wettsteinii*** Letz., *S. montanum* auct. non. L. — Perennial, persistent, rosette-leaves oblanceolate, acute, pubescent, viscid, 15-40 mm in diam., with leafy shoots, 5-15 cm high. **Seeds prolonged obovoid, slight flattish, apex and base with papillae and wings, 1-1.3 x 0.4-0.6 mm. Surface slight lustrous, yellowish-brown, coarse.  $2n = 42$ , c. 46, 60, 80.** Native to the European mountains, in alpine and subalpine zones, in silicate, acid or neutral stony soils, overgrown screes, stony slopes, rocks. Pl, Ro, Sk, Uk.

**1158. *Jovibarba globifera*** (L.) J. Parn., *Sempervivum globiferum* L. — Perennial, ground rosette of leaves 2-5 cm in diam., open, flowering stems of 20-50 cm, erect, dense leafy. **Seeds obpyriform or obovoid, apex with beak and wing, base apiculate with or without wing, 0.9-1.2 x 0.3-0.5 mm. Surface indistinct ribbed, slight lustrous, yellowish-brown.  $2n = 38$ .** Native to the Carpathians and the southeastern Alps, on rocks, screes, calcareous soils. Hu, Pl, Ro, Sk, Uk.

**1159. *Jovibarba heuffelii*** (Schott) Á. et D. Löve, *Sempervivum heuffelii* Schott — Perennial, rosettes 5-12 cm in diam., open, flowering stems 10-20 cm high. **Seeds obpyriform, without seldom with small wing on the apex, base narrowed with hilum, 0.9-1.1 x 0.5-0.6 mm. Surface with numerous longitudinal ribs, slight lustrous, pale-brown.  $2n = 38$ .** Native to the Balkan Peninsula mountains and the East Carpathians, on stony hills of the montane zone. Ro.

**1160. *Jovibarba preissiana*** (Domin) Omelcz et Czopik — Perennial, stems 20-30 cm high, leaves broadly lanceolate, the broadest in the middle part. **Seeds prolonged obovoid, with a small beak at the apex, bottom  $\pm$  truncate, with semitransparent wings, 1.2-1.3 x 0.5-0.6 mm. Surface longitudinal ribbed, slight lustrous, yellowish-brown.** Native to the Carpathians, on mountain calcareous grounds, stony slopes. Uk.



**1152****1153****1154****1155****1156****1157****1160****1159****1158**

**1161. *Jovibarba sobolifera*** auct. non (Sims) Opiz, *Sempervivum soboliferum* auct. non Sims — Perennial, stems 10-25 cm high,  $\pm$  glandular-hirsute, rosette globular, 2-4 cm in diam., closed. **Seeds obpyriform or obovoid, flattish, apex and base usually with a short testa wing or tail, 0.9-1.2 x 0.4-0.6 mm. Surface longitudinal ribbed, ribs faint crenate with indistinct transverse ribs, orange-brown.  $2n = 38$ .** Native to northern Europe from lowlands to subalpine areas, on sandy and basic foundations, often cultivated as rock-garden plant. Pl Ro, Sk, Uk.

#### 54. SAXIFRAGACEAE

**1162. *Tiarella cordifolia*** L. — Perennial, caespitose, flowering stems up to 25 cm high, evergreen, nice leaves create a very attractive carpet. **Seeds ellipsoid, apex rounded, bottom truncate, whole margin winged, 1.1-1.3 x 0.7-0.8 mm. Surface fine foveolate, high glossy, black.** Rarely cultivated in gardens as ornamental.

**1163. *Saxifraga adscendens*** L., *S. petraea* auct. non L. — Biennial, 5-25 cm high, stems simple or ramified in the upper part. **Seeds elliptic or obovoid, apex rounded or truncate with small papilla, base truncate, winged on one side, 0.3-0.5 x 0.2-0.3 mm. Surface longitudinal indistinct ribbed, fine tuberculate, lustreless, dark-brown.  $2n = 22$ .** Native to and scattered through a large part of Europe, mainly in mountains, rocky places and on cliffs, mountain brookbanks. Hu, Pl, Ro, Sk, Uk.

**1164. *Saxifraga aizoides*** L., *S. autumnalis* auct. non L. — Perennial, laxly caespitose, stems ascending, dense leafy, 10-25 cm high. **Seeds prolonged elliptic, constricted at both ends, with three distinct coarse ribs, 0.9-1.1 x 0.4-0.5 mm. Surface papillose tuberculate, slight lustrous, dark-brown.  $2n = 26$ .** Native to arctic and subarctic Europe, usually in damp stony places, near mountain streams, often on limestone rocks. Pl, Ro, Sk, Uk.

**1165. *Saxifraga androsacea*** L., *S. lanceolata* Kit. — Perennial, tufted, glanduliferous downy, stems 1-10 cm high. **Seeds elliptic or ovoid, with one to three distinct ribs, 0.8-0.9 x 0.3-0.4 mm. Surface verrucose, lustreless, dark-brown to black.  $2n = 16$ , c. 128.** An Eurosiberian element growing on snow-patches and damp, stabilized mountain screes. Pl, Ro, Sk, Uk.

**1166. *Saxifraga bryoides*** L., *S. aspera* auct. non L. — Perennial, dense tufted, cushions procumbent,

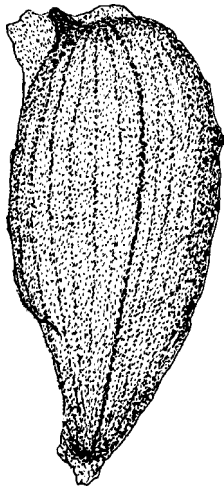
stems 2-20 cm high, dense leafy. **Seeds elliptic to ovoid, apex slight acute, base truncate, 0.5-0.7 x 0.2-0.3 mm. Surface mammiform tuberculate, faint lustrous, dark-brown.  $2n = 26$ .** Native to mountain sites (1500-2200 m elevation), on calcifuge rocks and stony places, from the Pyrenees, Alps, up to the Carpathians. Pl, Ro, Sk, Uk.

**1167. *Saxifraga bulbifera*** L., *S. granulata* auct. non L.: Lumn. — Perennial, 20-40 cm high, stems erect, simple, arising from a rather large bulb. **Seeds (left) elliptic or obovoid, with an indistinct rib, apex truncate, base narrowed, 0.4-0.5 x 0.2-0.3 mm. Surface papillose-tuberculate, lustreless, dark-brown. Rich source for the multiplication are a small, deciduous bulbils (or tubers) (right) formed in the axil of a leaf or replacing flowers in an inflorescence, and functioning to propagate the plant vegetatively.  $2n = 28$ .** Native to central and southern Europe, in dry and semi-steppe meadows, rock slits, light forests, mostly in sandy soils. Hu, Ro, Sk, Uk.

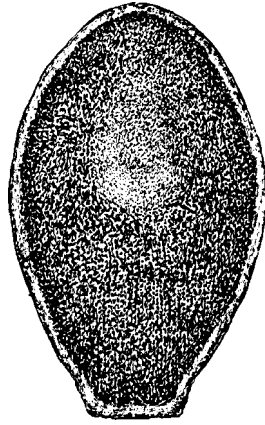
**1168. *Saxifraga caesia*** L. — Perennial, leafy shoots, dense caespitose, forming dense cushions, flowering stems 4-10 cm high, sparsely leafy. **Seeds elliptic or ovoid, with an indistinct rib, apex and base constricted, 0.6-0.8 x 0.3-0.4 mm. Surface papillose-tuberculate, blackish-brown.  $2n = 26$ .** Native to the mountains of central and southern Europe, on rocks, screes and stony calcicole grounds. Pl, Sk.

**1169. *Saxifraga carpathica*** Sternb., *S. rivularis* auct. non L. — Perennial, 6-15 cm high, tufted, stems erect, leafy, rather dense caespitose. **Seeds prolonged elliptic, with three hyaline ribs on ventral side 0.7-0.9 x 0.3-0.4 mm. Surface seriate verrucose, slight lustrous, brown to dark-brown.** Native to the Carpathians, on damp rocky places and screes in subalpine and alpine zones, a calcifuge. Pl, Ro, Sk, Uk.

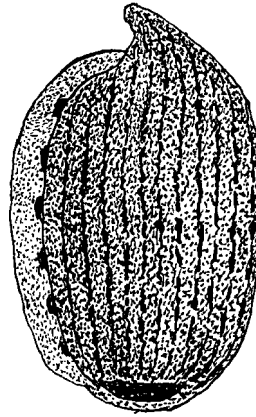
**1170. *Saxifraga cernua*** L. — Perennial, plant solitary or in small tufts, 7-30 cm, stems  $\pm$  ramified, leafy, usually with a solitary, terminal flower. **Seeds elliptic, a rib on ventral side, apex rounded, base truncate, with 0.6-0.7 x 0.3-0.4 mm. Surface fine verrucose, black.  $2n = 50, 64$ .** Native to arctic and subarctic zones, mountains of the Alps and the Carpathians; very rare, in damp or shady places, rocks and screes. Pl, Ro, Sk.



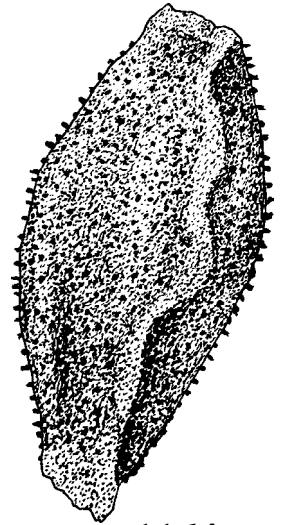
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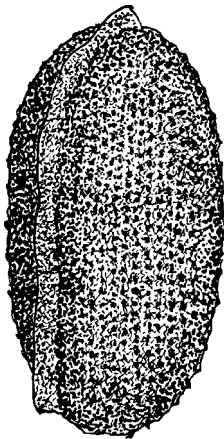
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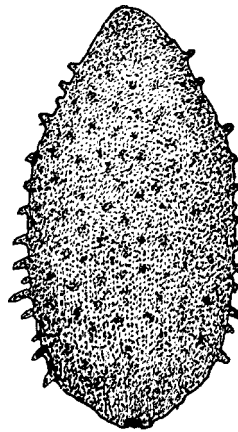
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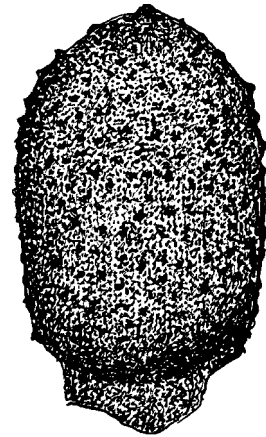
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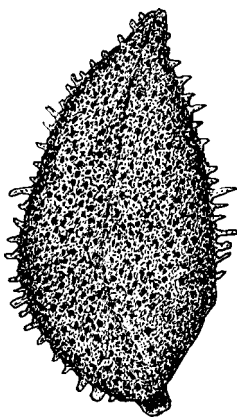
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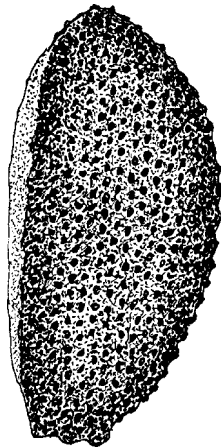
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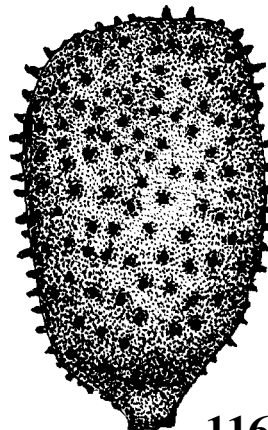
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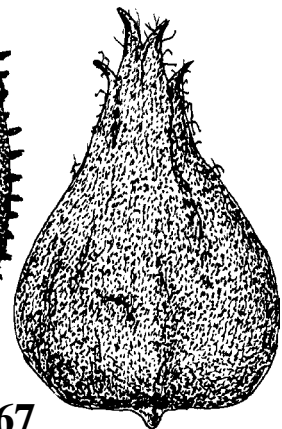
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**1171. *Saxifraga cuneifolia* L.** — Perennial, sparsely caespitose, flowering stems 10-20 cm high, procumbent, bearing small rosettes of leaves, flowers in a small panicle. **Seeds elliptic to obovate, tapering to both ends, 0.7-0.8 x 0.4-0.5 mm. Surface fine and distinct verrucose, black. 2n = 28.** Native to the mountains of southern Europe, mostly from 800 to 1700 m elevation, in woods and on shady rocks. Ro.

**1172. *Saxifraga cymbalaria* L.** — Annual, biennial, stems  $\pm$  flexuous, erect or prostrate, up to 30 cm high. **Seeds rounded, base tapering, 0.4-0.6 x 0.3-0.5 mm. Surface fine verrucose, blackish to black. 2n = 18.** Native to southeastern Carpathians and southwestern Asia, in wet valleys, besides rocks, in the montane zone; throughout the Carpathians often cultivated in rock-gardens and locally naturalized. Ro.

**1173. *Saxifraga granulata* L.** — Perennial, slender up to 50 cm high, stems usually stout, branches suberect, leaves mostly fleshy, in armpit with reproductive onions. **Seeds ellipsoid, lateral slight compressed, apex roundish, bottom narrowed, both papillaless, 0.5-0.6 x 0.25-0.35 mm. Surface tuberculate, lustrous, dark-brown. 2n = 32-60.** Native to Europe, on meadows, pastures, boundaries, grassy slopes, light woods, mostly in calcareous soils. Br, Hu, Pl, Ro, Sk, Uk.

**1174. *Saxifraga hieraciifolia* Waldst. et Kit., *S. racemosa* (Townson) Simonk.** — Perennial, stems usually simple, dense glanduliferous, downy, 10-40 cm high. **Seeds elliptic prolonged, irregular, cuneate, with a distinct rib on the ventral side, 0.9-1.3 x 0.4-0.5 mm. Surface verrucose with papillae seriate, slight lustrous, brown to blackish-brown. 2n = 112, 120.** Native to arctic Europe, the Carpathians and very locally in mountains elsewhere, on damp rocks and screes, moraines, or at mountain streams. Pl, Ro, Sk.

**1175. *Saxifraga hirculus* L., *S. autumnalis* L.** — Perennial, sparsely tufted or shortly shooted, stems erect, 20-35 cm high. **Seeds prolonged elliptic to ovoid, with a wing around the seed, 1.2-1.4 x 0.5-0.6 mm. Surface glabrous, lustrous, reticulate, with solitary fork-hairs, yellowish- and red-brown. 2n = 32.** Native to northern, central and eastern Europe, on bogs and other wet places. Br, Pl, Ro, Uk.

**1176. *Saxifraga hostii* Tausch** — Perennial, dense caespitose, stem 20-60 cm high, panicle-branches mostly with at least 3 flowers. **Seeds prolonged ovoid**

**with crooked apex, bottom with a large hilum, 0.7-0.9 x 0.3-0.4 mm. Surface tuberculate in longitudinal rows, lustreless, brownish-black to black. 2n = 28.** Native to the Alps, on calcareous grounds; in the Carpathians often cultivated in gardens as a very attractive species.

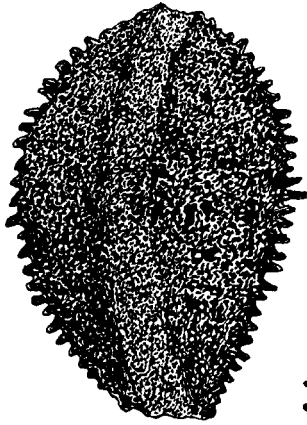
**1177. *Saxifraga luteoviridis* Schott et Kotschy, *S. corymbosa* Boiss.** — Perennial, caespitose with a crowded leaf-rosette, branched, flowering stems erect, up to 15 cm high. **Seeds irregular elliptic to planoconvex, on dorsal side with stronger and on ventral side with feeble papillae, apex with a hump, base truncate, 0.7-0.8 x 0.4-0.5 mm. Surface papillose tuberculate, dull, black.** Endemic to the mountains of East and South Carpathians and Bulgaria, on limestone rocks, above 1500 m elevation, rare. Pl, Ro, Uk.

**1178. *Saxifraga marginata* Sternb., *S. rocheliana* Sternb.** — Perennial, densely caespitose, shoots erect or ascendent, flowering stems erect, 4-12 cm high. **Seeds prolonged elliptic, constricted on both sides, 1-1.2 x 0.4-0.5 mm. Surface papillose tuberculate or only undulate, slight lustrous, blackish-brown.** Originally growing in the South Carpathians and the Balkan Peninsula, on mountain rocks, calcicole, rare. Ro.

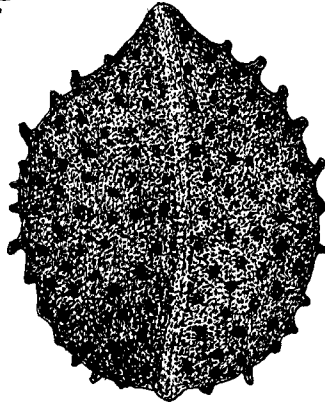
**1179. *Saxifraga moschata* Wulfen, *S. exrata* Vill.** — Perennial, tufted up to cushiony-shaped, dispersely glanduliferous hirsute, flowering stems 2-10 cm high. **Seeds elliptic with a distinct groove on ventral side, 0.7-1 x 0.4-0.5 mm. Surface fine tuberculate, dark-brown to black. 2n = 22, 24, 26, 28, 32, 34, 36, 44, c. 50, 52.** Native to the mountains of central and southern Europe, on shady rocks, cliffs, screes, mostly on basic grounds, often cultivated in cemeteries, rock-gardens in various cvs. Pl, Ro, Sk.

**1180. *Saxifraga mutata* L., *S. demissa* Schott et Ky.** — Perennial, laxly caespitose in leaf rosettes, stems 5-30 cm high, ramified in the upper part. **Seeds prolonged elliptic, spindle-like, tapered on both sides, 0.6-0.8 x 0.3-0.4 mm. Surface dense verrucose, light- or dark-brown. 2n = 28.** Native to the Alps and Carpathians, on calcareous rocks, sandy stands. Ro, Sk.

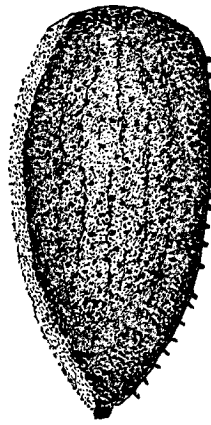
**1181. *Saxifraga nivalis* L.** — Perennial, tiny, with same rosettes of ground leaves, flowering stems 4-5 cm high. **Seeds prolonged elliptic or pyriform, tapered on both sides, 0.8-1 x 0.4-0.5 mm. Surface covered with low cupola warts, dark-brown to**



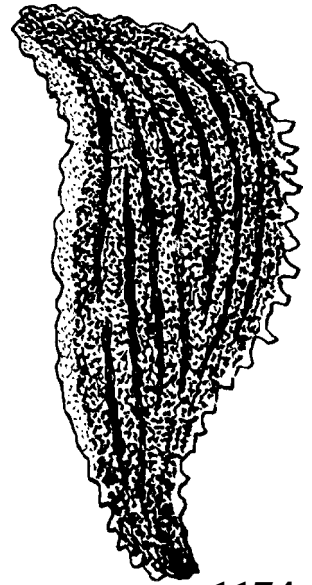
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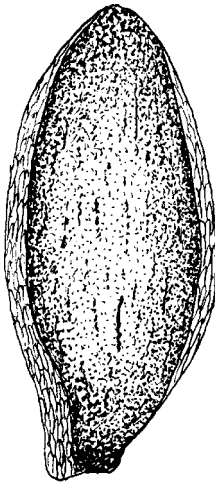
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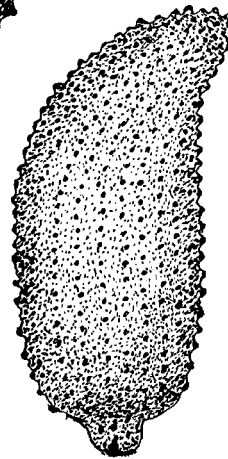
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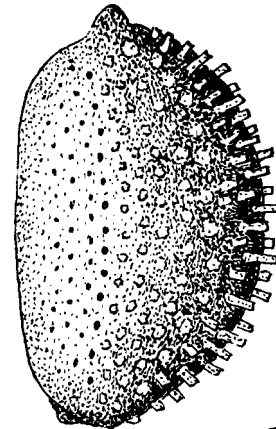
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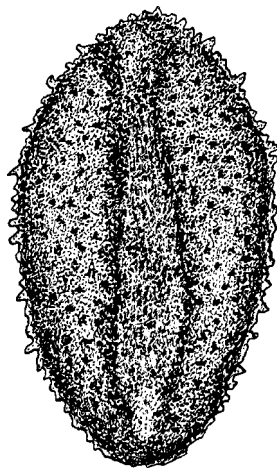
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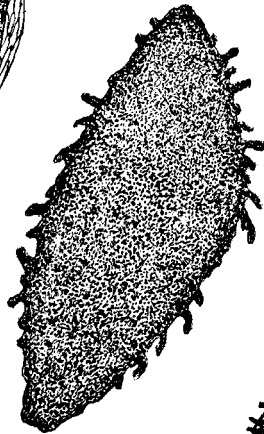
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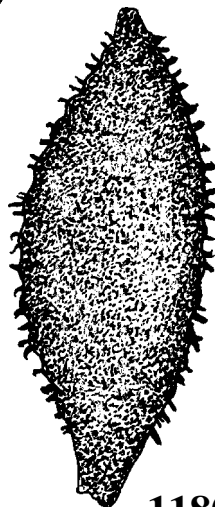
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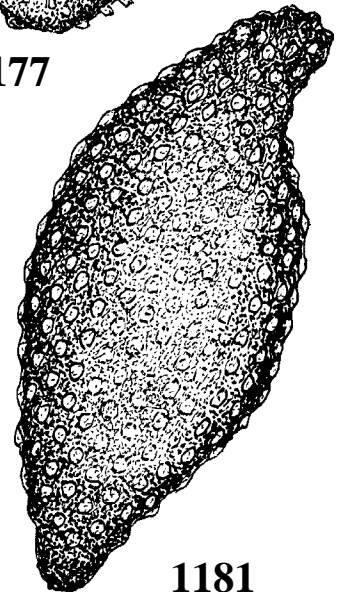
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1181

**black.  $2n = 60$ .** Native to arctic and subarctic Europe, very local in mountains, elsewhere on wet rocks. Pl, Ro.

**1182. *Saxifraga oppositifolia* L.** — Perennial, plant pillowy tufted, stems  $\pm$  procumbent, ascending, 2-5 cm high. **Seeds shape irregular, ellipsoid-obovoid to planoconvex, apex and base usually with a rail or wing of the testa,  $1.1-1.4 \times 0.6-0.7$  mm. Surface undulate or granulate, raphe on ventral side distinct, dark- to black-brown.  $2n = 26$ .** Native to Eurasia, in arctic, subarctic zones and high mountains of central Europe, seldom cultivated in rock-gardens in many cvs and hybrids. Pl, Ro, Sk, Uk.

**1183. *Saxifraga paniculata* Mill., *S. aizoon* Jacq.** — Perennial, often with a leaf-rosette, flowering stems, 5-30 cm high, ramified in the upper part. **Seeds prolonged semielliptic to planoconvex, on surface with tree distinct rounded edges, with a longitudinal wing on ventral side,  $0.8-1.1 \times 0.4-0.5$  mm. Surface very fine verrucose, dark-brown to black.  $2n = 28$ .** Native to the mountains of central and southern Europe, in subalpine and alpine zones, in calcareous, stony places; commonly seen in cultivation. Ro, Sk, Uk.

**1184. *Saxifraga pedemontana* All. subsp. *cymosa* (Waldst. et Kit.) Engler** — Perennial, woody at the base, caespitose, glanduliferous hirsute, flowering stems, 5-8 cm high, erect. **Seeds prolonged elliptic to obovoid, with two or three raphes,  $0.7-0.9 \times 0.4-0.5$  mm. Surface covered with minute warts, blackish-brown.  $2n = 42$ .** Native to the Carpathians and the Balkan Peninsula, on siliceous shaded rocks, screes, in subalpine and alpine zones. Ro, Uk.

**1185. *Saxifraga retusa* Gouan, *S. baumgartenii* Schott** — Perennial, pillowy tufted, dark-green, stems up to 5 cm, procumbent, with ascending upper part. **Seeds prolonged elliptic, ovoid, apex rounded, pointed, base truncate,  $1-1.2 \times 0.5-0.6$  mm. Surface longitudinal fine furrowed, slight lustrous, raphe distinct, dark-brown to black.  $2n = 26$ .** Native to the higher mountains of Europe, usually above 1800 m elevation, in snow-free rocks or screes. Pl, Ro, Sk.

**1186. *Saxifraga rosacea* Moench, *S. decipiens* Ehrh., *S. caespitosa* L.** — Perennial, scarcely caespitose, downy, non-flowering shoots variously long, flowering 5-25 cm. **Seeds ellipsoid, obovoid or sausage-shaped, transversal section  $\pm$  rounded,  $0.6-0.7 \times 0.35-0.45$  mm. Surface longitudinal verru-**

**cose, lustreless, blackish-brown.  $2n = 50, 52, 55, 56, 64$  (103).** Native to northwestern and central Europe, on rocks and screes, of limestone and dolomite moist substrates. Hu, Pl, Sk.

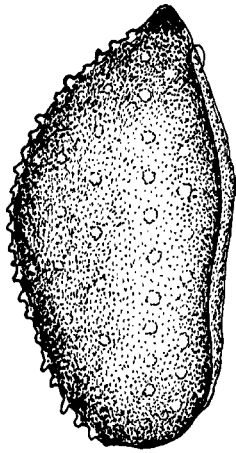
**1187. *Saxifraga rotundifolia* L.** — Perennial, stems erect, sparsely leafy, 15-60 cm high, ramified in the upper part. **Seeds elliptic, apex rounded or truncate, with a longitudinal rib on the ventral side,  $0.5-0.6 \times 0.3-0.4$  mm. Surface fine verrucose, lustreless, blackish-brown.  $2n = 22$ .** Native to the mountains of central and southern Europe, in damp shady places, forests, on calcareous grounds, in or near the mountains, commonly seen in cultivation. Pl, Ro, Sk.

**1188. *Saxifraga sarmentosa* L., *S. stolonifera* Meerb.** — Perennial, a plant with thin stolons, sometimes ramified, stems erect, 20-40 cm high. **Seeds elliptic, apex rounded or truncate, bottom narrowed with an oval hilum,  $0.4-0.5 \times 0.2-0.4$  mm. Surface humpy, slight lustrous or lustreless, black.** Originally spread from eastern Asia, in damp, shade rocks, walls and riverbanks; in the Carpathians commonly cultivated in gardens as an ornamental.

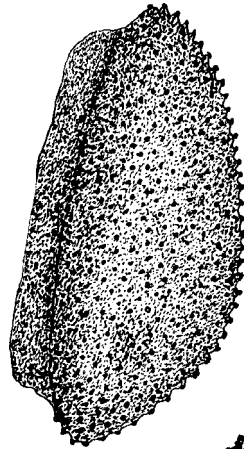
**1189. *Saxifraga stellaris* L.** — Perennial, ramified, flowering stems simple, up to 10 cm high, dense or laxly caespitose. **Seeds prolonged elliptic, ovoid or reniform, with longitudinal spinulous ribs, winged on ventral side,  $0.6-0.8 \times 0.3-0.4$  mm. Surface glabrous, lustreless, dark-brown.  $2n = 28$ .** Native to the East Carpathians, at mountain springheads, streams, other damp places, in subalpine and alpine zones. Pl, Ro, Uk.

**1190. *Saxifraga tridactylites* L., *Tridactylites annua* Haw.** — Annual, 3-20 cm high, glanduliferous downy, without ground rosette, stems erect, mostly ramified. **Seeds elliptic or triangular, obovoid, longitudinal rib on ventral side, apex truncate,  $0.3-0.4 \times 0.2-0.3$  mm. Surface covered with sparse localised warts, lustreless, dark-brown.  $2n = 32$ .** Native to Europe and southwestern Asia, on sunny stony slopes and rocks, roads, walls, fallows, somewhat calcicole; in all Carpathian territories.

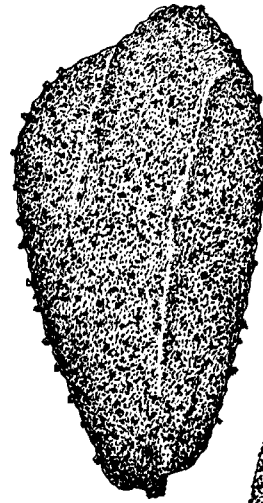
**1191. *Saxifraga umbrosa* L.** — Perennial, dense tufted, ground rosettes flat, flowering stems 10-40 cm high. **Seeds elliptic, apex rounded or tapered, bottom slanted with a hilum,  $0.6-0.8 \times 0.3-0.4$  mm. Surface dense verrucose, lustreless, blackish-brown.  $2n = 28$ .** Native to the Pyrenees, in shady, damp places of mountains, grasslands and stream



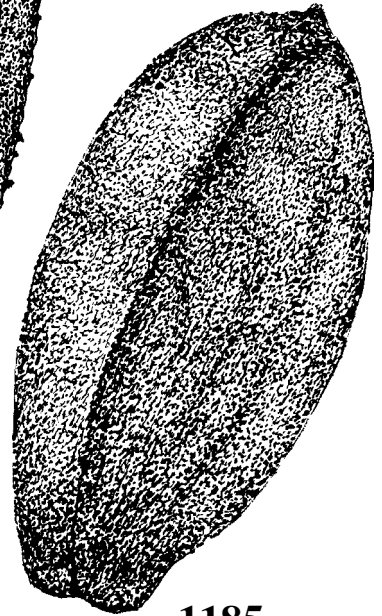
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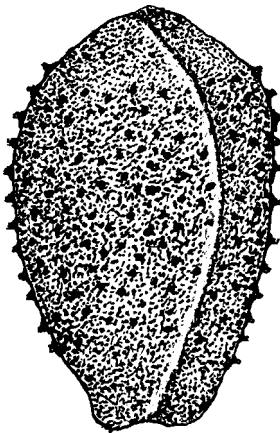
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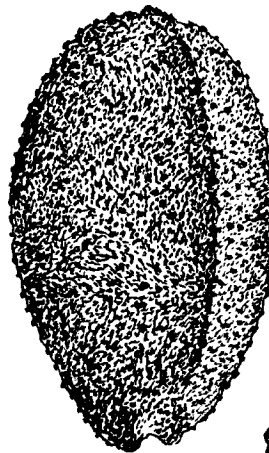
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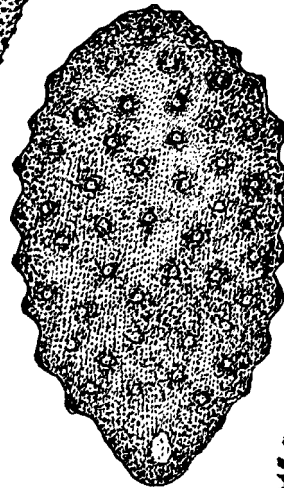
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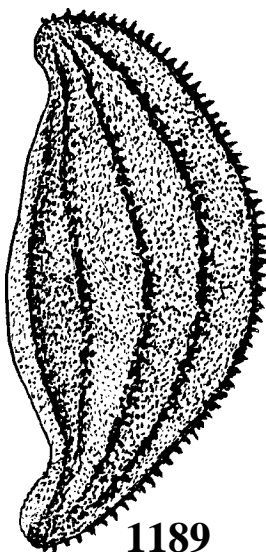
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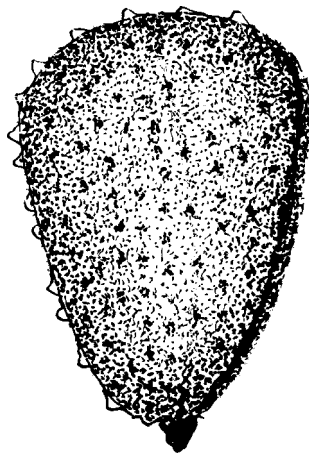
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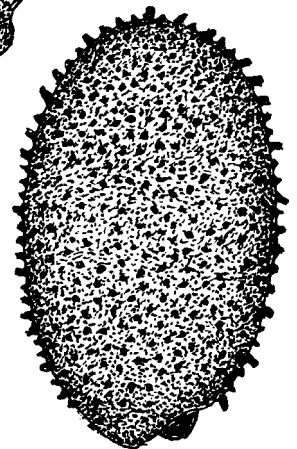
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sides; commonly cultivated in rock-gardens, mostly as hybrid *S. hirsuta* x *umbrosa*.

**1192. *Saxifraga wahlenbergii*** Ball, *S. perdurans* Kit. — Perennial, fleshy, scarcely tufted,  $\pm$  glabrous, stems decumbent, 2-15 cm high,  $\pm$  leafless. **Seeds elliptic, apex rounded, 0.6-0.8 x 0.3-0.4 mm. Surface verrucose, slight lustrous, black.  $2n = 66$ .** West-Carpathian endemic, on damp rocks, screes, snow deck-chairs, grassy slopes, mainly in calcareous soils. Pl, Sk.

**1193. *Astilbe arendsii*** hort. — Perennial, a comprehensive designation for hybrids from *Astilbe davidii* Henry with the name of the plant breeder, who used the species *A. davidii* for breeding. From these breedings came many cvs and hybrids, very interesting in shape, colour and growth. **Seeds ellipsoid or spindleform in a non-transparent cover, 1.3-1.5 x 0.3-0.4 mm. Surface longitudinal shallow and dense furrowed, dull, cinnamon-brown.** Cultivated as an attractive ornamental plant in gardens and parks; throughout the Carpathians.

**1194. *Astilbe davidii*** Henry, *A. chinensis* (Maxim.) Franch. et Savat. var. *davidii* — Perennial, stems up to 1.5 m high, leaves 2 or 3 x plumose, 2.5-3.5 mm long, non-equable serrate on the margin. **Seeds fusiform, lateral slight compressed, in cover, 1.5-1.9 x 0.3-0.5 mm. Surface smooth, lustrous, brown.** Native to central and northern China, near springheads and along torrents, in subalpine zone; in the Carpathians cultivated in gardens in many cvs and hybrids as an ornamental.

**1195. *Astilbe japonica*** Gray., *Hoteia japonica* C. Morren et Decne — Perennial, ramified plant up to 60 cm high, glabrous, with reddish, densely rusty hirsute stems. **Seeds prolonged ellipsoid, cover tapering at both ends and distinct suture, 1.8-2.6 x 0.2-0.3 mm. Surface glabrous, pale-brown.** Native to Japan; cultivated in gardens and parks as an ornamental plant, but only in hybrid forms.

**1196. *Astilbe simplicifolia*** Mak. — Perennial, a comprehensive collection of low cvs with crispy leaves labeled as *Astilbe crispa*, originated from an accidental seedling, which was discovered perhaps as a mutant in Arends plantations. **Seeds ellipsoid or spindleform in a nontransparent cover tapering on both ends, 1.6-1.8 x 0.2-0.3 mm. Surface longitudinal shallow and dense furrowed, lustreless,**

**cinnamon-brown.** Exploitation of this cvs group in gardening is very wide.

**1197. *Astilbe thunbergii*** (Siebold et Zucc.) Miq. — Perennial, flowering stems 80-100 cm high, inflorescence narrow, pyramidal, ramified, with white to pink flowers. **Seeds prolonged ellipsoid, with suture on ventral side, bottom gradually narrowed, 1-1.3 x 0.4-0.5 mm. Surface longitudinal shallow furrowed, slight lustrous, cinnamon-brown.** Native to China and Japan; often cultivated in gardens and parks in the whole Carpathians.

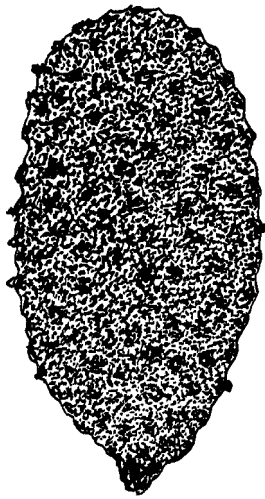
**1198. *Bergenia cordifolia*** hort. — Perennial, flowering stems up to 30 cm, leaves large, evergreen, in winter reddish, rounded, serrate. **Fruits capsules, curved trapezoid with longitudinal deep and broad furrows, 1.8-2.2 x 0.9-1.1 mm. Surface slight wrinkly, faint lustrous, brownish-black or black.** Originally growing in Siberia and the Altai mountains; in gardens and rock-gardens usually cultivated form are mostly hybrids.

**1199. *Bergenia crassifolia*** (L.) Fritsch, *B. bifolia* Moench — Perennial, a plant with a creeping rhizome, up to 2 cm in diam., flowering stems 20-50 cm erect, glabrous, leafless. **Fruits capsules, curved trapezoid with longitudinal deep and broad furrows, 1.4-1.7 x 0.5-0.6 mm. Surface glabrous, lustreless, dark-brown.  $2n = 34$ .** Originally growing in central and eastern Asia; often cultivated in gardens, cemeteries and parks in many cvs as an ornamental, locally naturalized.

**1200. *Heuchera americana*** L. — Perennial, stems 50-60 cm high, slender, leafless, aerial panicle with campanulate greenish-white flowers. **Seeds obovoid to pyriform, transversal section oval or roundish, apex rounded, bottom gradually narrowed, 0.6-0.8 x 0.4-0.5 mm. Surface dense spinulose, dull, black.** Originally spread from the southern part of North America, in mixed forests; introduced into the Carpathians and often planted in gardens as an ornamental, mostly in hybrid form.

**1201. *Heuchera sanguinea*** Engelm. — Perennial, flowering stems 30-50 cm high, leafless, glandular above, ground leaves rounded cordial. **Seeds elliptic, obovoid, longitudinal ribbed with hyaline excrescences, 0.8-0.9 x 0.3-0.5 mm. Surface lustreless, black.  $2n = 14$ .** Originally spread from North America (New Mexico), in relatively warm and dry mountain

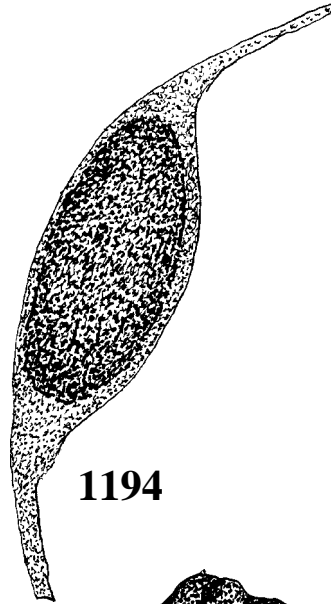




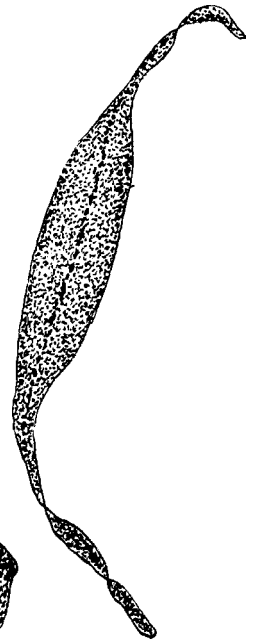
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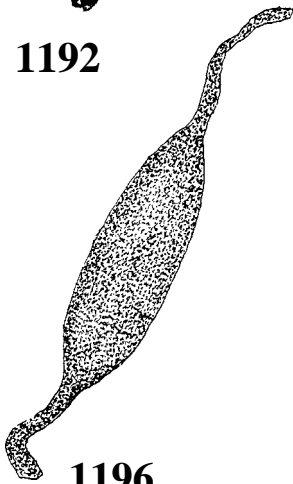
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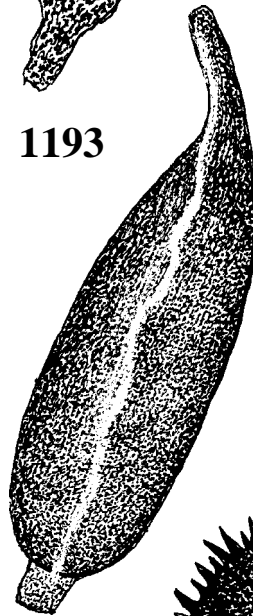
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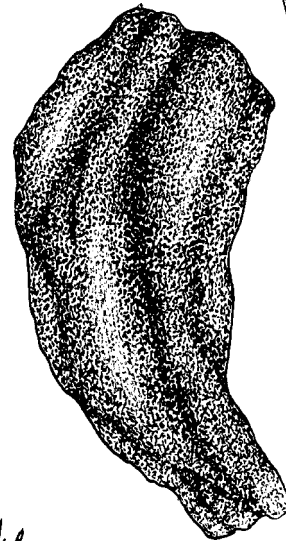
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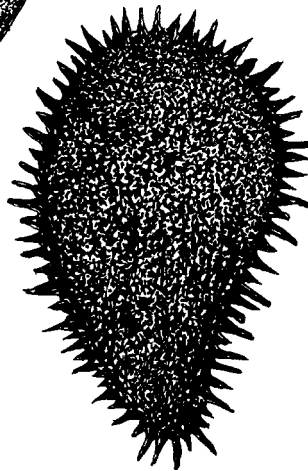
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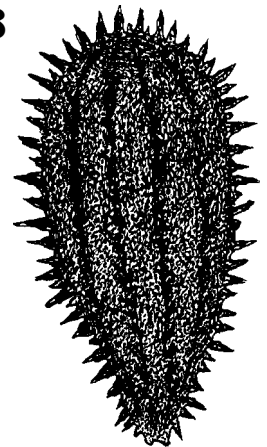
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1200



1201

areas; in the Carpathians often cultivated in gardens and cemeteries.

**1202. *Chrysosplenium alternifolium* L., *Ch. nivale* Schur** – Perennial, without procumbent shoots, stems at base hirsute, 5-20 cm high, 3-angled. **Seeds ellipsoid, apex obtuse, radicle narrow, longer than the mighty cotyledons, 0.6-0.8 x 0.4-0.5 mm. Surface glabrous, smooth, shining, dark purple-brown. 2n = 48.** Native to Euro-Siberia, in damp, shady forests, brookbanks, boundaries, scrubs and other places; in all Carpathian territories.

**1203. *Chrysosplenium oppositifolium* L., *Ch. alpinum* Schur** – Perennial, laxly caespitose, with decumbent-rooted shoots, stems hirsute below, 5-20 cm high, 4-angular. **x 0.4-0.5 mm. Surface lustrous, minute hairy, purple-brown to dark-brown. 2n = 42.** Native to western and central Europe, in damp and shady places, springheads, brookbanks, dampy rocks, mostly in non-calcareous soils. Pl, Ro, UK.

**1204. *Tellima grandiflora* (Pursh) Dougl.** – Perennial, raceme 15-25 cm, secund, glandular-pubescent, basal leaves long-petiolate, palmately 5- to 9-lobed. **Seeds ovoid or ellipsoid, slight flattish, margin slight hemmed, 0.9-1 x 0.4-0.5 mm. Surface slight wrinkly, lustreless, dark-brown.** Native to North America, in woods and shady walls; in the Carpathians rarely cultivated in gardens and locally naturalized in damp, shady places.

## 55. DROSERACEAE

**1205. *Drosera anglica* Huds., *D. longifolia* auct. non L.** – Perennial, solitary plants, flowering stems 10-18 cm high, erect, leaves in a ground rosette. **Seeds narrow ellipsoid, with semitransparent reticulate sheath, 1-1.7 x 0.3-0.4 mm; inner seeds ellipsoid, apex with a beak, 0.4-0.6 x 0.2-0.3 mm. Surface dull, smooth, very fine areolate, black-brown. 2n = 40.** Native to northern and central Europe, very rare in the south, on wet peatbogs, heaths, in subalpine and alpine zones. Br, Hu, Pl, Ro, Sk, UK.

**1206. *Drosera intermedia* Hayne** – Perennial, tufted, stems procumbent, pseudodichotomous ramified, leaves of ground rosette semi-erect. **Seeds prolonged obovoid in testa, apex and base obtuse, 0.6-0.8 x 0.3-0.4 mm. Surface dull, dense tuberculate, testa orange, dark- to black-brown. 2n = 20.** Native to

northern Europe and North America, usually in moorlands, *Sphagnum* hummocks, damp sandy and loamy soils. Br, Pl, Ro, UK.

**1207. *Drosera rotundifolia* L.** – Perennial, plants solitary, stems erect, 3-8 cm high, leaves spreading horizontally, sometimes semi-erect, creating ground rosettes. **Seeds narrow ellipsoid, testa loose-fitting, reticulate, 1.5-1.7 x 0.2-0.3 mm; inner seeds ellipsoid, 0.3-0.5 x 0.2-0.3 mm. Surface dull, smooth, very fine areolate, dark-brown. 2n = 20.** Native to Euro-Siberia and North America, on peatbogs, shallow bog-pools. Br, Hu, Pl, Ro, Sk, UK.

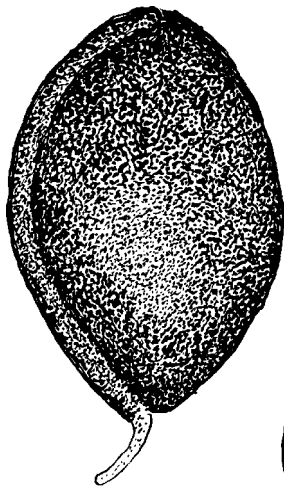
## 56. ROSACEAE

**1208. *Spiraea alba* Duroi** – Shrub, up to 2 m high, twigs erect, dense flowers white. **Seeds shape narrow ellipsoid, flattish, apex and base with a testa tail, 1.6-1.8 x 0.3-0.4 mm. Surface glabrous, fine reticulate, raphe visible as a low rib, orange-brown. 2n = 36.** Native to North America, cultivated in parks; locally naturalized in Europe.

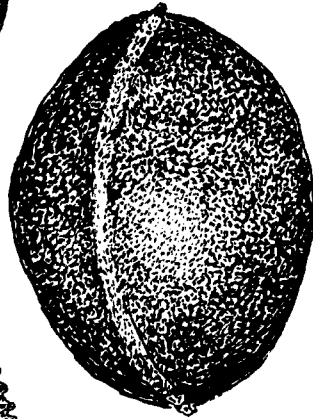
**1209. *Spiraea chamaedrifolia* L., *S. ulmifolia* Scop.** – Shrub, up to 2 m high, twigs angular, dense ramified, brown, bare, flowers white. **Seeds narrow ellipsoid flattish, exarillate, raphe usually as low rib, 1.8-2.2 x 0.4-0.6 mm. Surface granulate, cinnamon-brown. 2n = 18, 36.** Native to northeastern Asia, on sunny, stony and rocky slopes, low woodlands and scrubs; throughout the Carpathians cultivated in parks and orchards.

**1210. *Spiraea corymbosa* Raf.** – Shrub, up to 1 m high, twigs arcuate, erect, flowering twigs crooked. **Seeds mostly conical ellipsoid, slight compressed, on both ends narrowed, apex with beak, base mostly narrow truncate, 2.2-2.6 x 0.4-0.5 mm. Surface indistinct granulate in longitudinal rows, light lustrous, brown. 2n = 36.** Originally growing in North America; in the Carpathians often cultivated in parks, uniquely naturalized.

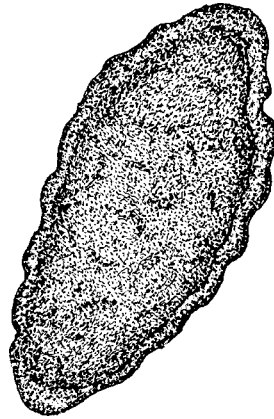
**1211. *Spiraea crenata* L., *S. crenifolia* C. A. Mey.** – Shrub, up to 1 m high, twigs erect, when young hirsute, reddish-brown, flowering crooked. **Seeds narrow oblong elliptical, flattish, longitudinal indistinct dense ribbed, 1.9-2.5 x 0.4-0.5 mm. Surface glabrous, pale-brown to brown. 2n = 36.** Native to southeastern Europe and southwestern Asia, on stony hills, in rocky places, scrubs and calcareous grounds. Hu, Mo, Ro, Sk, UK.



1202



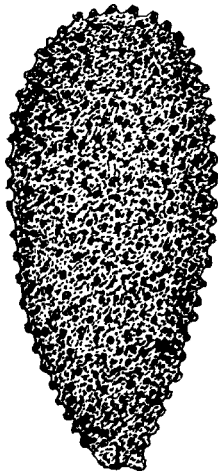
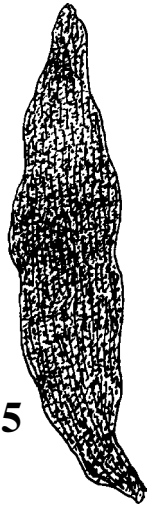
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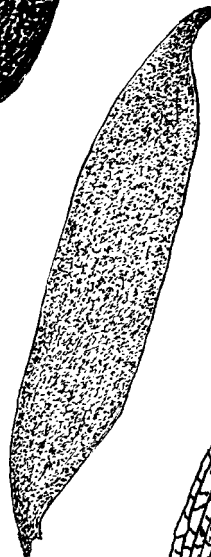
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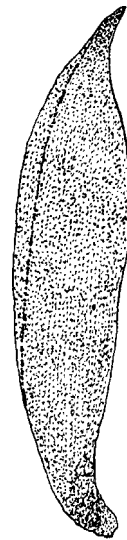
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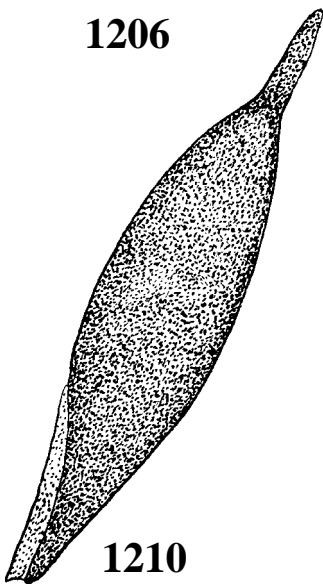
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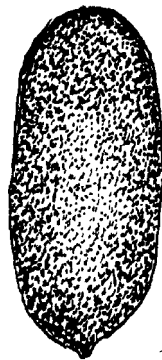
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**1212. *Spiraea decumbens*** W. Koch, *S. procumbens* hort. — Procumbent shrub with ascending twigs, about 25 cm high, flowers white. **Seeds  $\pm$  spindleform, lateral flattish, with darker apex, hem and bottom, 1.4-1.6 x 0.4-0.5 mm. Surface longitudinal faint furrowed, slight lustrous, pale-brown.** Native to southern Europe; in the Carpathians planted only in rock-gardens.

**1213. *Spiraea douglasii*** Hook. — Shrub, up to 2.5 m high, stems erect, dense, flowers dark-pink. **Seeds spindleform or ellipsoid, slight compressed, apex with a beak, bottom narrowed, hilum roundish, 1.6-1.8 x 0.3-0.4 mm. Surface fine reticulate-foveolate, lustrous, pale-brown. 2n = 36.** Native to North America; in the Carpathians often planted in parks, uniquely naturalized in coastal shrubberies.

**1214. *Spiraea hypericifolia*** L. — Shrub, up to 1.5 m high, twigs erect, rounded or weakly angular, bare or hirsute, flowering crooked. **Seeds narrow elliptic, flattish, exarillate, 2-2.5 x 0.3-0.5 mm. Surface glabrous, reticulate-areolate, slight lustrous, brown. 2n = 18.** Native to south-eastern Europe and central Asia, in scrubs, on hillsides or on steep banks; in the Carpathians cultivated in gardens and parks. Mo, Ro, UK.

**1215. *Spiraea japonica*** L. fil. — Shrub, up to 1.5 m high, young twigs hirsute, flowers pink. **Seeds narrow ellipsoid, flattish, planoconvex, elongated on base and apex, with pale distinct wings on plane side, 1.4-1.6 x c. 0.4 mm. Surface distinct reticulate-areolate, dark-brown. 2n = 16, 36.** Originally spread from eastern Asia; cultivated in orchards and parks in many cvs, locally naturalized.

**1216. *Spiraea media*** F. Schmidt, *S. chamaedrifolia* auct. non L., *S. oblongifolia* Waldst. et Kit. — Shrub, up to 1.5 m high, twigs oval, erect, flowering twigs crooked, multiflowered. **Seeds oblong ellipsoid, slight compressed, planoconvex, with or without a narrow wing, 1.8-2.1 x 0.35-0.45 mm. Surface fine transversal wrinkly, with one longitudinal rib, lustreless, pale-brown. 2n = 18.** Native to Japan, on sunny, stony and shrubby slopes, in the montane zone. Hu, Mo, Pl, Ro, Sk, UK.

**1217. *Spiraea prunifolia*** Siebold and Zucc. — Shrub, up to 1.5 m high, twigs angular, downy when young, leaves oblong ellipsoidal, 2-5 cm long. **Seeds oblong ellipsoid, compressed, in non-transparent cover,**

**1.8-2.2 x 0.4-0.5 mm. Surface fine longitudinal undulate, lustrous, pale-brown. 2n = 18.** Native to eastern Asia; in the Carpathians rarely cultivated in parks, in full blossom cvs, having orange leaves in autumn.

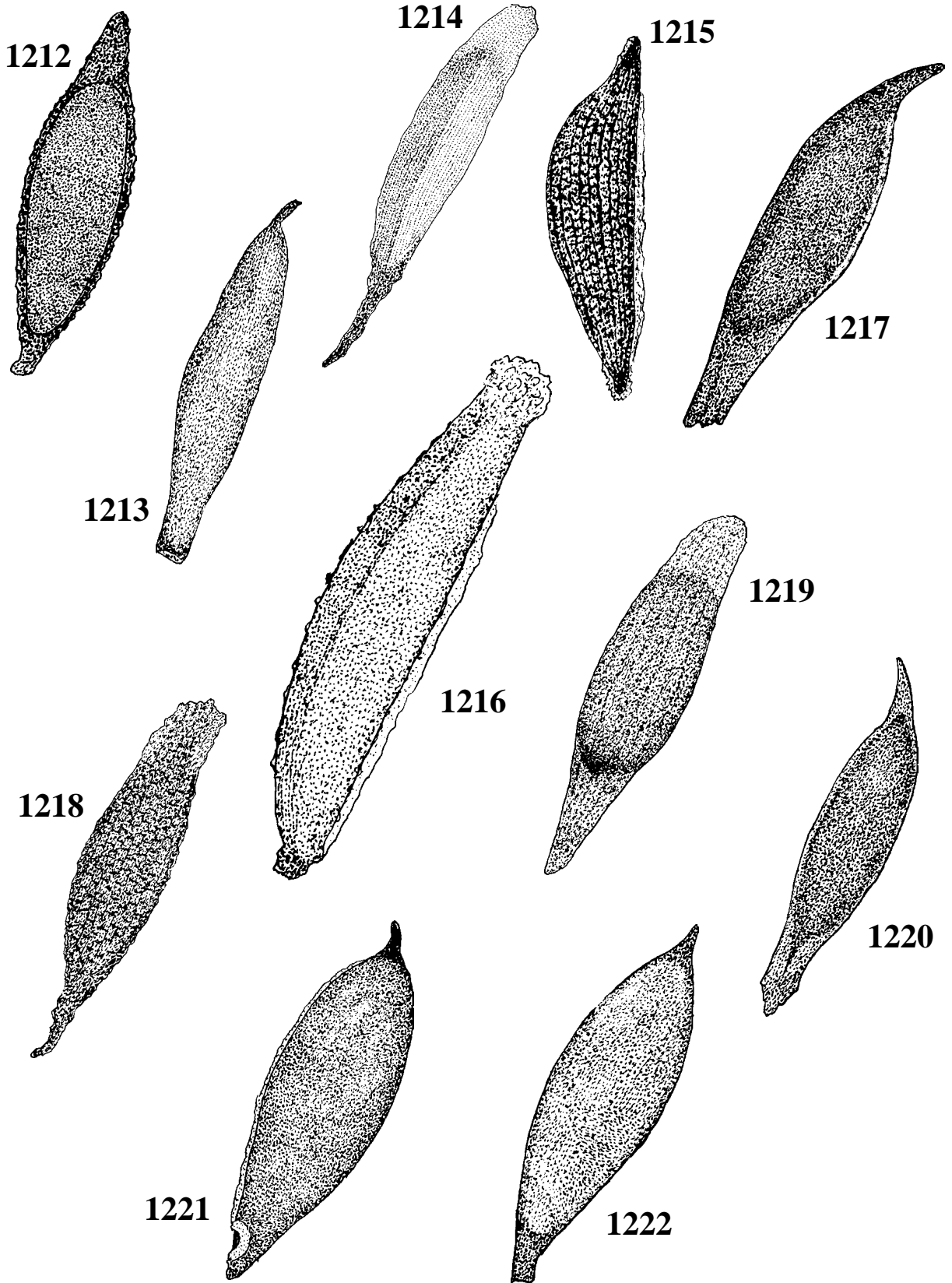
**1218. *Spiraea salicifolia*** L. — Shrub, up to 1-2 m high, twigs erect, downy when young, glabrous later on, inflorescence paniculate. **Seeds oblong oval, slight compressed, narrow winged, 1.8-2.2 x 0.4-0.5 mm. Surface longitudinal faint furrowed, transversal wrinkly, lustreless, yellowish-brown. 2n = 36.** Native to Eurasia, in coastal thickets, lowland woods, peatbogs, previously cultivated and easily naturalized in humid, overflowed, mostly calcifugous soils. Hu, Mo, Pl, Ro, Sk, UK

**1219. *Spiraea thunbergii*** Siebold — Shrub, up to 1.5-2 m high, twigs angular, downy when young, leaves linearly lanceolate, 2-4 cm long. **Seeds oblong ellipsoid, lateral compressed, in a semi- or non-transparent cover, 1.8-2 x 0.4-0.5 mm. Surface slight longitudinal furrowed and colliculate, faint lustrous, pale-brown. 2n = 18.** Native to eastern Asia; in the Carpathians rarely cultivated for its orange and reddish leaves in autumn.

**1220. *Spiraea tomentosa*** L. — Shrub, up to 1.5 m high, twigs numerous, erect, rusty tomentose when young. **Seeds prolonged ellipsoid, slight flattish, longitudinal ribbed, narrowed at both ends, apex with a beak, 1.6-2 x 0.3-0.4 mm. Surface granulate, slight lustrous, pale-brown to brown. 2n = 36.** Native to North America; in the Carpathians often cultivated in parks, uniquely naturalized.

**1221. *Spiraea trilobata*** L. — Shrub, up to 1.5 m high, flowers white, leaves nearly rounded, 3-5 veined at base. **Seeds  $\pm$  spindleform, lateral slight compressed, ventral side with a longitudinal suture, apex beaked, hilum on ventral side with a broad whitish hem, 1.6-1.8 x c. 0.5 mm. Surface faint transversal wrinkly, yellowish-brown, lustreless.** Native to Siberia, northern China, Turkestan; in the Carpathians, scarcely planted in parks and gardens.

**1222. *Spiraea x bumalda*** Burv., *S. pumila* Zab. — Small shrub, up to 75 cm high, young twigs grooved, glabrous. **Seeds conical ellipsoid, slight flattish, narrowed at both ends, apex with short beak, base mostly truncate, 1.5-1.8 x 0.45-0.55 mm. Surface granulate in distinct prolonged rows, slight**



**lustrous, pale- or dark-brown.** Hybrid *S. japonica* x *albiflora*; often cultivated in parks, gardens and town verdure.

**1223. *Spiraea x vanhouttei*** (Briot) Zab. — Shrub, up to 2 m high, twigs crooked with abundant semirounded white flower umbels. **Seeds narrow elliptical, flattish to planoconvex, with a light-brown longitudinal raphe, 1.7-2 x 0.4-0.5 mm. Surface indistinct reticulate, orange- and dark-brown.** Hybrid origin (*S. cantoniensis* x *trilobata*); in the Carpathians often cultivated and naturalized in coastal shrubberies.

**1224. *Physocarpus opulifolius*** (L.) Maxim., *Spiraea opulifolia* L. — Shrub, up to 3 m high, bare or sparsely downy. **Seeds prolonged obovate to pyriform, apex rounded, with a narrow raphe in the lower part, 1.9-2.1 x 1-1.2 mm. Surface smooth, yellowish- to greenish-brown, lustrous. 2n = 18.** Originally spread from North America; in Europe cultivated in parks as a decorative plant, sometimes naturalized in coastal shrubberies.

**1225. *Sorbaria sorbifolia*** (L.) A. Br., *Spiraea sorbifolia* L. — Shrub up to 2 m high, twigs erect, rhizomes with procumbent shoots. **Seeds narrow oblong ellipsoid, apex and base acuminate, 3.2-3.6 x 0.6-0.8 mm. Surface tuberculate with reticulate structure, orange-brown. 2n = 36.** Originally spread with northeastern Asia; cultivated as an ornamental, in the most part of Europe, in parks, orchards, hedgerows, locally naturalized.

**1226. *Exochorda albertii*** Regel — Shrub, up to 4 m high, flowers 3-4 cm in diam. **Seeds planoconvex to crescent-shaped, lateral strongly compressed, with a broad semitransparent wing, 7.6-8.4 x 5-5.6 mm. Surface undulate, lustreless, brown, margin wing paler.** Native to central Asia; in the Carpathians planted in parks and gardens as an ornamental and medicinal species.

**1227. *Exochorda giralddii*** Hesse — Very nice shrub of erect growth, flowering richly in spring, flowers c. 5 cm in diam. **Seeds planoconvex to crescent-shaped, lateral strong compressed, broad winged around, 8-9 x 5-5.8 mm. Surface sinuate, faint lustrous, brown.** Originally growing in China; in the Carpathians, rarely cultivated in parks as an ornamental.

**1228. *Exochorda grandiflora*** (Hook.) Lindl., *E. racemosa* Rehder — Shrub, up to 6 m high, bare, deciduous. **Seeds planoconvex to semi-rounded, very flattish, all seeds broad winged around, 7-9 x 4-5.5 mm. Surface glabrous, dark-brown.** break Originally spread from China; often cultivated in parks as an ornamental. Very similar seeds belong to the species *E. albertii* Regel, and *E. giralddii* Hesse.

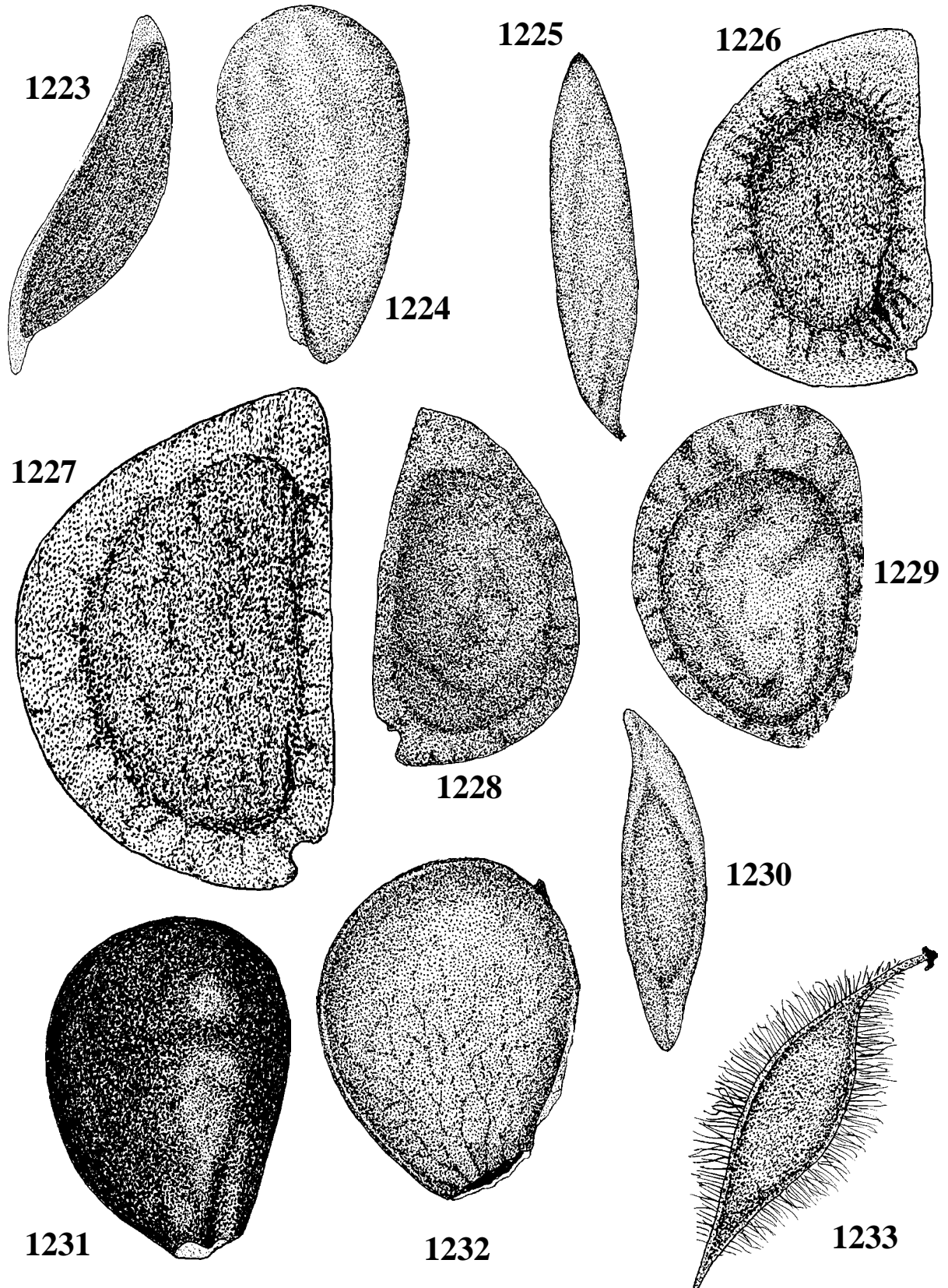
**1229. *Exochorda korolkowii*** Lavallée — Shrub, up to 4 m high, flowers in 5-8 flowering bunches, 3-4 cm in diam. **Seeds ± ovate or semicrescent-shaped, lateral strong compressed, biconvex, broad winged around, 8-10 x 5-6 mm. Surface smooth, slight sinuate, faint lustrous, reddish-brown.** Native to Turkestan; in the Carpathians rarely planted in parks as an ornamental, flowering in spring.

**1230. *Aruncus vulgaris*** Raf., *A. dioicus* (Walter) Fernald, *A. sylvestris* Kostel. — Perennial, stem erect, 0.5-2 m high, unramified. **Seeds narrow ellipsoid, apex and base tapered, 1.8-2.3 x 0.4-0.6 mm. Surface glabrous, fine reticulate, reddish-brown. 2n = 14, 18.** A circumpolar species in montane areas, in scrubs and forests, mostly along streams and amongst rocks in damp or shady places. Br, Hu, Pl, Ro, Sk, Uk.

**1231. *Rhodotypos scandens*** (Thunb.) Makino, *R. kerrioides* Siebold et Zucc. — Shrub, up to 2 m high, deciduous, flower white. **Seeds rounded, obovoid with a hard and fragile shell and stone, 7.5-9 x 6-6.6 mm. Surface of the shell smooth, lustrous, black, that of the stone lustreless, glabrous, yellowish-white. 2n = 18.** Originally spread from eastern Asia; often cultivated in parks and gardens as an ornamental shrub, sometimes naturalized.

**1232. *Kerria japonica*** (L.) DC., *Rubus japonicus* L. — Shrub, up to 2.5 m high, twigs green, deciduous, flowers yellow. **Fruits achenes, rounded, obovoid with a raphe all around, dry, inconspicuous, 3.8-4.5 x 3.1-3.5 mm. Surface glabrous with distinct nervation, greyish- to blackish-brown. 2n = 18.** Native to eastern Asia (China); widely cultivated in parks and gardens as an ornamental in warmer areas of the Carpathians, mostly in full-blossom forms.

**1233. *Filipendula camtschatica*** (Pall.) Maxim. — Perennial, stems up to 150-200 cm high, faint ramified, flowers white, in dense inflorescences. **Fruits achenes, spindleform lateral flattish, gradually narrowed above and below, 4.5-5 x 1-1.2 mm.**



Surface  $\pm$  glabrous, margins dense hairy, lustreless, pale-brown. Native to eastern Asia; in the Carpathians rarely cultivated in parks, more decorative than *F. ulmaria*.

**1234. *Filipendula rubra*** (Hill.) Robins – Perennial, stems 100-150 cm high, faint or unramified, with a large leaves. **Fruits achenes,  $\pm$  spindleform, apex with long beak, bottom narrowed, 4-4.4 x 1-1.2 mm. Surface dense hairy at margins, dull, light-brown. Seeds  $\pm$  oval, 2-3 x 0.6-0.8 mm. Surface lustreless, reddish-brown.** Native to North America, on meadows and moist places; in the Carpathians cultivated in gardens and parks as decorative.

**1235. *Filipendula ulmaria*** (L.) Maxim., *Spiraea ulmaria* L. – Perennial, stems 50-200 cm high, simple or sparsely ramified, flowers white. **Fruits achenes,  $\pm$  reniform and  $\pm$  spiral twisted, flattish, ventral suture  $\frac{3}{4}$  the length of the achene, 3-4 x 1.3-1.7 mm. Surface glabrous, veinous, yellowish-to dark-brown.  $2n = 14$ .** Native to Eurasia, common in wet meadows, in ditches and wet woods; in all Carpathian territories.

**1236. *Filipendula vulgaris*** Moench., *F. hexapetala* Gilib. – Perennial, stems up to 80 cm high, bare, simple, flowers white, pink on the reverse side. **Fruits achenes, ellipsoid flattish, apex with beak, 3-4 x 1.4-1.8 mm. Surface moderate hairy, strigose, smooth, light-buff to buff-brown.  $2n = 14$ .** Native to Europe, Asia Minor as far as Siberia, on moist meadows, semi-dry turfs, light woodlands. Hu, Mo, Pl, Ro, Sk, Uk.

**1237. *Rubus arcticus*** L. – Perennial, shoots woody, ramified, blunt-triangular, thornless. **Seeds obovoid, slight compressed, apex rounded, bottom narrowed, hilum on ventral side, 2.2-3.2 x 1.3-2 mm. Surface transversal or irregular wrinkly, smooth, lustreless, pinkish-white.** Native to Euro-Siberia, in moist, light woods, wet meadows and shrubberies, peatbogs. Pl.

**1238. *Rubus caesius*** L., *R. coarctatus* P. J. Müll. – Low shrub, shoots climbing on the ground, stems provided with prickles, round, creeping. **Seeds ovate, lateral flattish, ventral side straight, dorsal side convex, 2.2-3.2 x 1.3-2 mm. Surface reticulate, interspaces of reticulum irregular, light-violet to violet.  $2n = 28$ .** Native to Eurasia, in marshy woods, weedy places of moist uncultivated soils, likes wet, nitrogenous soils; in all Carpathian territories.

**1239. *Rubus candicans*** Weihe ex Rchb., *R. montanus* Lej. – Shrub, shoots highly arched, weakly woody grooved, thorns sickle-shaped, scarcely. **Seeds obovoid, slight compressed, apex truncate, base narrowed, distinct suture on lateral side, 2.5-3 x 1.7-2.1 mm. Surface lustreless, orange-brown, reticulate-alveolate, alveoli irregular.  $2n = 21, 35$ .** Native to Europe, on forest margins, shrubby slopes, calciferous, stony grounds. Hu, Mo, Pl, Ro, Uk.

**1240. *Rubus chamaemorus*** L. – Perennial, stems 5-20 cm high, erect, unramified, glandular. **Seeds ovoid, dorsal surface with a thin inconspicuous suture, sometimes slight lateral flattish, 3.5-5 x 2.5-3 mm. Surface smooth to  $\pm$  cracked, whitish to yellowish-white.  $2n = 56$ .** Native to northern Europe, on mountain moors and bogs. Br, Pl.

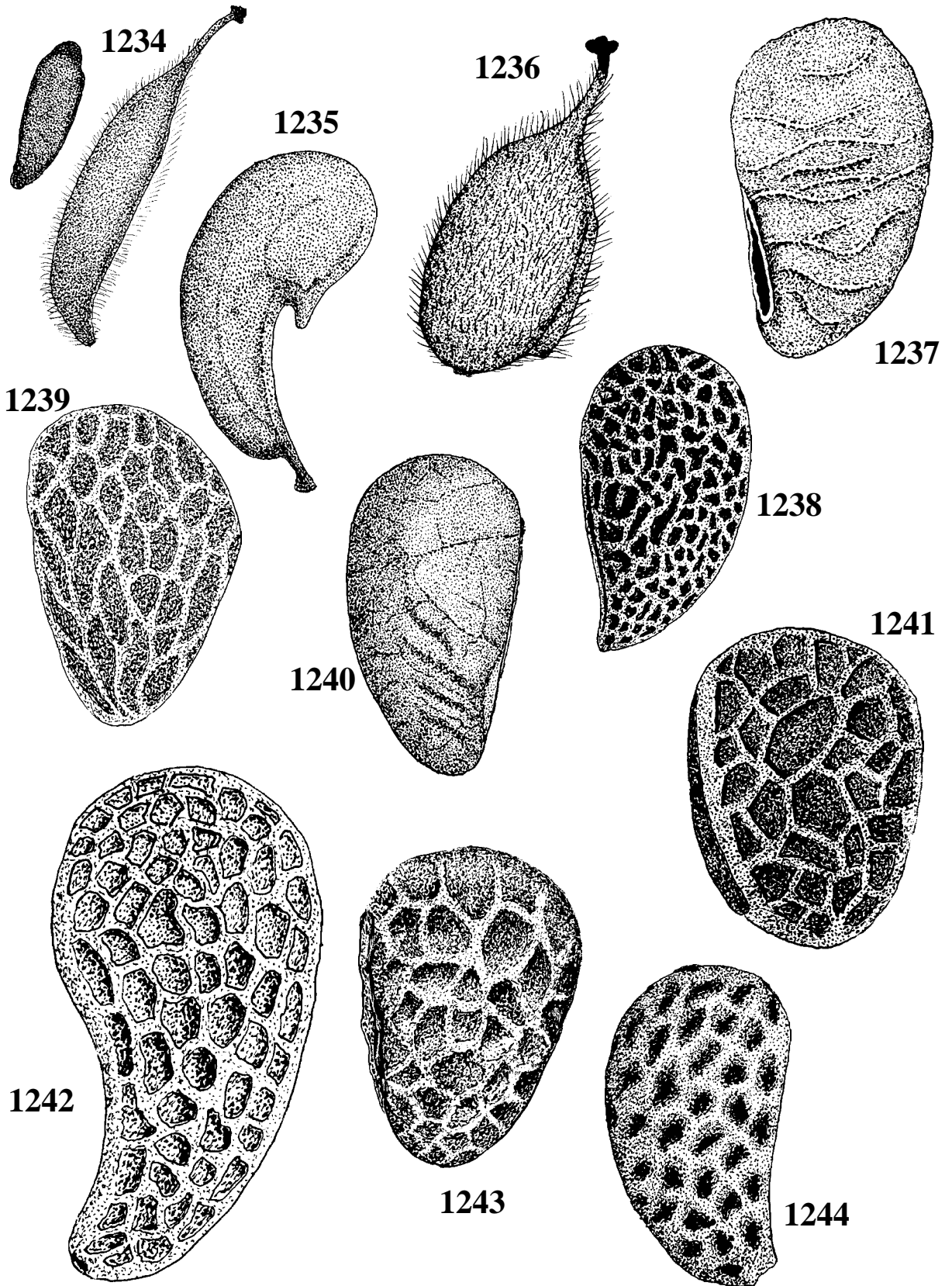
**1241. *Rubus divaricatus*** P. J. Mueller, *R. nitidus* Weihe et Ness – Shrub, stem up to 100 cm high, shining brown to violet, sparsely hairy or glabrous, with long, straight prickles. **Seeds obovoid, with ribs on ventral and dorsal side, 2.3-2.8 x 1.8-2.2 mm. Surface reticulate-aveolate, lustreless, violetish dark-brown.  $2n = 21$ .** Native to western and southern Europe, on cut-areas, light woods, shrubberies, riverbanks. Hu, Pl, Ro, Sk, Uk, rarely.

**1242. *Rubus fruticosus*** L. – Shrub, stems mostly overhanging and very prickly, creeping or decumbent. **Seeds ovoid to broad ovoid,  $\pm$  lateral flattish, 2.8-4.2 x 1.9-2.8 mm. Surface reticulate, ribs of reticulum expressive, interspaces irregular, often elongated, dorsal suture distinct yellowish-brown.  $2n = 28$ .** A species growing in community with many other species, native to Eurasia, in wood margins, fields, gardens, heathy hedgerows; in all Carpathian territories.

**1243. *Rubus hirtus*** Waldst. et Kit., *R. crassus* Holuby – Shrub, shoots lowly arched thick, pubescent, thorns variable. **Seeds obovoid, slight compressed, apex truncate, base narrowed, lateral wing is all the seed round, 2.3-2.9 x 1.5-2 mm. Surface reticulate-alveolate, dull, reticulum yellowish-brown, alveoli irregular, violetish.  $2n = 28$ .** This *Rubus*-species is the most widespread in the Carpathians, in deciduous and coniferous woodlands, clearings, on stony and sandy grounds.

**1244. *Rubus idaeus*** L., *Batidaea vulgaris* Nieuwl. – Shrub, up to 150 cm high, tufted, trunklets erect,





rounded, when young hoary. **Seeds ovoid to obovoid, lateral flattish, dorsal suture distinct, 2-3 x 1.4-1.8 mm. Surface reticulate, interspaces of reticulum irregular, often elongated, light-pink. 2n = 14.** Native to most of Europe, on damp woodlands, clearings, wood margins in montane and submontane areas; in all Carpathian territories.

**1245. *Rubus laciniatus* Willd.** – Perennial, shoots coarse, striate, bare, with many sickle-shaped thorns. **Seeds ovoid to semi-rounded, flattish, dorsal suture distinct, 2.7-3.3 x 2.1-2.8 mm. Surface reticulate, interspaces of reticulum irregular, light-violet. 2n = 28.** Place of origin and distribution unknown; cultivated for ornament, widely naturalized in many areas. Hu, Pl, Ro, Sk.

**1246. *Rubus macrophyllus* Weihe et Ness, *R. rhombifolius* Hal.** – Shrub, shoots up to 3-4 m high, erect, procumbent or ascending later on, cylindric above, angular below. **Seeds obovoid, slight compressed, dorsal side with a longitudinal narrow rib, ventral side with a broader rib, 2.6-3.2 x 1.8-2.2 mm. Surface reticulate-areolate, lustreless, whitish or pinkish. 2n = 28.** Native to northwestern and central Europe, in moist leafy woods, cut-over areas, calcicole soils. Hu, Pl, Ro, Sk.

**1247. *Rubus odoratus* L., *Rubacer odoratus* (L.) Rydb.** – Shrub, up to 3 m high, trunklets erect, at young stage glandular and hirsute. **Seeds oblonged semi-elliptic or semiovoid, lateral flattish, ventral side straight, dorsal convex, base obtuse, 1.6-2 x 0.9-1.1 mm. Surface reticulate-alveolate, reticulum interspaces irregular, pinkish-violet. 2n = 14.** Originally spread from North America; cultivated for ornament and naturalized in moist forests and clearings.

**1248. *Rubus phoenicolasius* Maxim.** – Shrub, up to 3 m high, trunklets dense reddish-brown and bristly glandular. **Seeds semi-rounded, flattish, planoconvex, dorsal suture distinct, 1.7-2.1 x 1.3-1.5 mm. Surface reticulate, interspaces of reticulum irregular, light-pink or light-violet. 2n = 14.** Native to eastern Asia; often cultivated as an ornamental and for the edible fruit, occasionally naturalized.

**1249. *Rubus plicatus* Weihe et Ness** – Shrub, shoots erect, bent, up to 2 m high, angular, thorns sickle-shaped. **Seeds broad ovate, lateral flattish, with a distinct suture on lateral side, 2.5-3 x 1.8-2.2 mm. Surface reticulate-alveolate, reticulum interspaces**

**irregular, yellowish and light-violet. 2n = 28.** Native to Eurasia, in light forests, clearings, felled areas, coastal shrubberies. Hu, Pl, Ro, Sk, Uk.

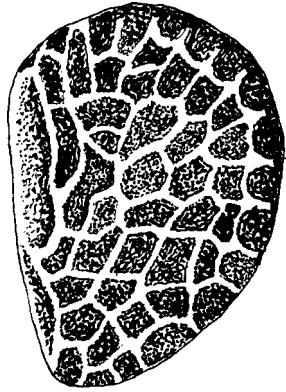
**1250. *Rubus radula* Weihe et Boenn** – Shrub, up to 1.5 m high, shoots thick, arcuate angular, glabrous or pubescent, thorns irregular. **Seeds obovoid, slight compressed, lateral suture longitudinal, apex weak rounded, base narrowed, 2-2.5 x 1.3-1.7 mm. Surface reticulate-alveolate, lustreless, pale or violetish-brown. 2n = 28.** Native to central and north-eastern Europe, on woodland margins and shrubberies, in wet, basic grounds. Hu, Pl, Ro, Sk.

**1251. *Rubus saxatilis* L., *Cylactis saxatilis* (L.) Á. Löve** – Shrub, up to 30-50 cm high, stems woody at the bottom, non-flowering procumbent, flowering erect, fine thorny. **Seeds ovoid to broad ovoid, slight flattish, 4-5 x 3-3.7 mm. Surface reticulate, interspaces of reticulum often elongated, yellowish. 2n = 28.** Native to temperate and arctic Eurasia, in woodlands, with porous, calciferous soils, rich humous. Br, Hu, Pl, Ro, Sk, Uk.

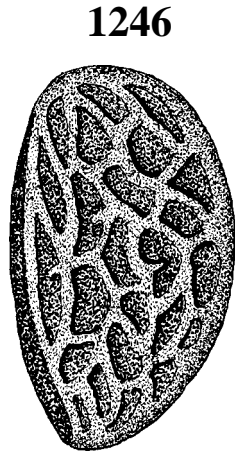
**1252. *Rubus schleicheri* Weihe** – Shrub, procumbent or creeping, stems angular below, cylindric above,  $\pm$  hirsute, thorns dense, pale, flattish, broad below, crooked. **Seeds obovoid or crescent-shaped, biconvex to planoconvex, lateral slight compressed, ribbed around, 1.8-2.2 x 1.4-1.6 mm. Surface reticulate-foveolate, lustreless, pale-brown. 2n = 28.** Native to central Europe, in forest margins, mountain woods and meadows. Hu, Pl, Ro, Sk.

**1253. *Rubus sulcatus* Vest ex Tratt.** – Shrub, up to 3 m high, shoots, very thick, groovy-angular, thorns, sparse, strong crooked down. **Seeds subtriangular, slight compressed, whole three corner rounded, lateral suture longitudinal, with a raphe on dorsal side, 2.2-2.7 x 1.5-1.9 mm. Surface reticulate-alveolate, dull, violetish-brown. 2n = 28.** Native to central and northern Europe, in forest clearings, coastal thickets, on calcifuge grounds. Hu, Pl, Ro, Sk, Uk.

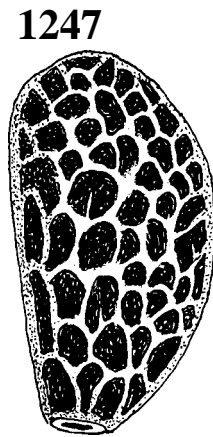
**1254. *Rubus sylvaticus* Weihe et Nees** – Shrub, shoots flexible, arched to procumbent, angular, pubescent above. **Seeds semispherical to planoconvex, slight compressed, with lateral suture, 2-2.5 x 1.3-1.6 mm. Surface reticulate-alveolate, lustreless, reticulum pale-brown, alveoli**



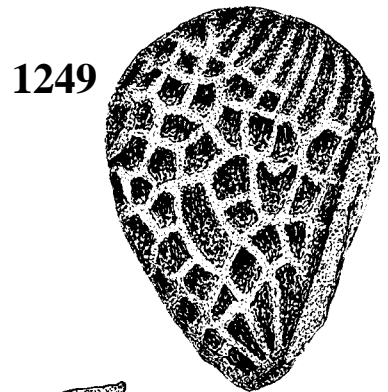
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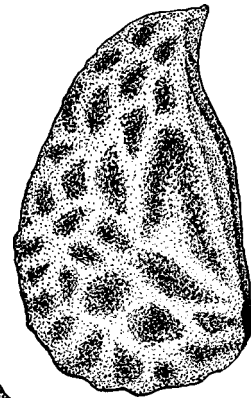
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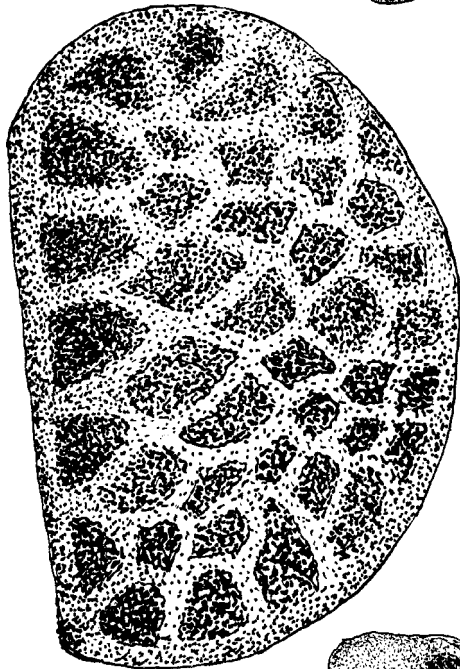
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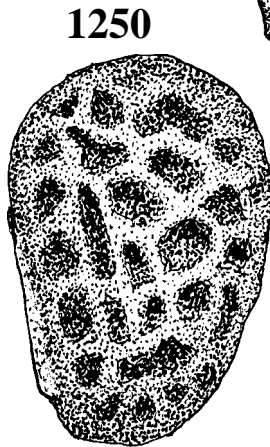
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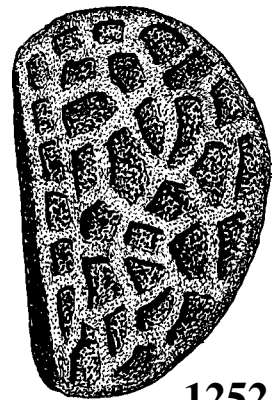
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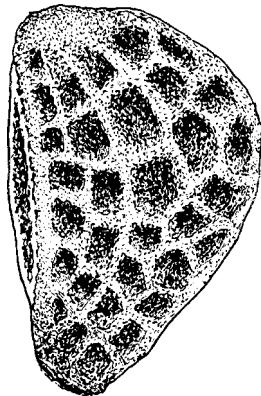
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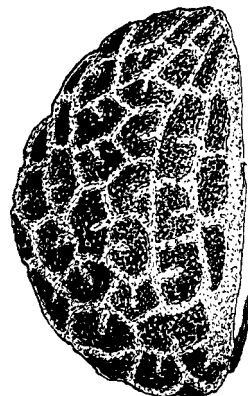
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1252



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1254

violetish.  $2n = 28$ . Native to central and western Europe, in forest clearings, rare. Cz, Hu, Pl, Ro, Sk.

**1255. *Rubus tomentosus*** Borkh., *R. canescens* DC. — Shrub, up to 50-100 cm high, shoots arcuate, procumbent to erect, pubescent, thorns mellow, variable. **Seeds semispherical to semiellipsoidal, slight compressed, lateral suture narrow, faint expressive, apex with a small beak, 3-3.4 x 1.9-2.5 mm. Surface reticulate-alveolate, dull, brown.  $2n = 14$ .** Native to central and eastern Europe, Asia Minor, on forest margins, scrubs, pastures. Hu, Mo, Ro, Sk.

**1256. *Rubus ulmifolius*** Schott — Shrub, shoots thick, arching or procumbent, angled, glabrous, thorns strong, falcate. **Seeds obovoid, compressed, lateral suture longitudinal, dorsal side with a narrow-raphe, apex truncate, base narrowed, rounded, 2.5-3 x 1.8-2.2 mm. Surface reticulate-alveolate, lustreless, violetish-brown.  $2n = 14$ .** Native to central Europe, in wet lowland forests, coastal thickets. Sk.

**1257. *Rubus vestitus*** Weihe et Nees — Shrub, shoots angled, pubescent, scarcely glandular, thorns dark-reddish, awl-shaped. **Seeds obovoid, compressed, apex truncate, base narrowed and rounded, lateral suture long, dorsal side with narrow raphe, 2.2-2.6 x 1.6-1.9 mm. Surface reticulate-alveolate, dull, pale or faint violetish-brown.  $2n = 28$ .** Native to central Europe, on forest edges, cut-over areas and scrubs. Pl, Ro, Sk.

**1258. *Rosa agrestis*** Savi, *S. albiflora* Opiz — Shrub, up to 2-3 m high, twigs short, prickles crooked. **Achenes various shaped, mostly ellipsoid or ovoid, angular, slight hairy at the apex, 4.5-5.5 x 2.4-2.8 mm. Surface glabrous, faint lustrous, pinkish.  $2n = 42$ .** Native to Europe, on wood margins, boundaries, pastures, light oak-woods; in the Carpathians fairly widespread in warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**1259. *Rosa alba*** L. — Shrub, up to 1 m high, twigs, with curved thorns, leaf of 5-7 leaflets. **Achenes oval, apex often with a remnant of the style, suture on ventral side, 5.8-6.2 x 3.4-3.7 mm. Surface smooth or fine foveolate, slight lustrous, pale-brown.** Native to eastern Asia; cultivated in gardens as an ornamental hybrid (*R. gallica* x *R. dumetorum*). Hu, Ro, Sk, Uk.

**1260. *Rosa arvensis*** Huds., *R. sylvestris* Herrm., *R. repens* Scop. — Shrub, low, procumbent, deciduous,

flower white. **Achenes mostly rounded or prolonged elliptic, ventral suture distinct, 6-7 x 3.7-4.3 mm. Surface tuberculate, deep furrowed, bloody, hilum white.  $2n = 14$ .** Native to central, southern and western Europe, in dry, deciduous and mixed woodlands, scrubs at slopes and banks, calcicole. Hu, Pl, Ro, Sk, Uk.

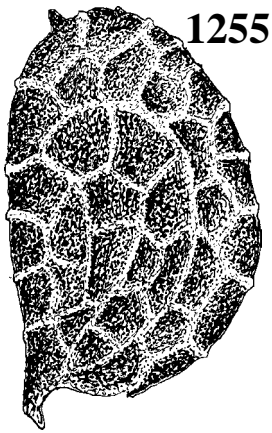
**1261. *Rosa blanda*** Ait. — Shrub, up to 2 m high, unarmed shoots without thorns, in young state with scattered acicles. **Achenes ovoid, dorsal side rounded, ventral rooflike with a concave suture, apex narrowed, base rounded, 4-5.2 x 2.2-3 mm. Surface mostly smooth or fine foveolate, faint lustrous, yellowish to reddish-brown.  $2n = 14$ .** Originally growing in North America; cultivated as an ornamental shrub in gardens and parks, often naturalized.

**1262. *Rosa caesia*** Sm., *R. coriifolia* Fries, *R. afzeliana* subsp. *coriifolia* (Fries) R. Keller et Gams — Shrub, deciduous, with short internodes, up to 2 m high, leaflets pubescent to glabrous above, sparsely glandular. **Achenes irregular oblong-oval, longitudinal rib on ventral side, 3.3-3.7 x 1.8-2.2 mm. Surface smooth, lustreless, pale, reddish or blackish-brown.** Most of Europe, eastwards to the central Ukraine, at wood margins, sunny coasts, screes, from lowland to montane zones. Hu, Pl, Ro, Sk.

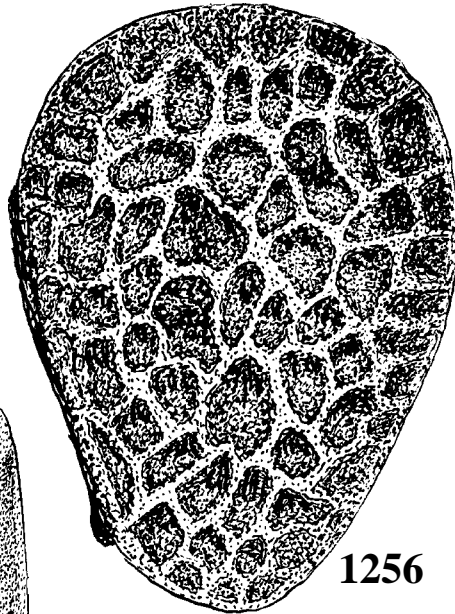
**1263. *Rosa canina*** L., *R. communis* Rouy, *R. squarrosa* (Rau) Boreau — Shrub, up to 3 m high, shoots erect, green, flowering trunklets without prickles. **Achenes usually three-sided, in outline oval or ovoid, dorsal area arched, ventral areas flat with a suture, 5.5-6.5 x 2.8-3.5 mm. Surface glabrous, with hairs around the hilum and in the upper part, yellowish or orange.  $2n = 35$ .** Native to Europe in deciduous woodlands, hedges, wood margins and thickets. Hu, Mo, Pl, Ro, Sk, Uk.

**1264. *Rosa carolina*** L., *R. humilis* Marsh., *R. parviflora* Ehrh. — Shrub, up to 1-2 m high, twigs short, thorns crooked or straight, twigs sometimes thornless. **Achenes mostly ovoid, small beak at the apex, suture on ventral side, 3.4-4 x 1.8-2.2 mm. Surface smooth, faint lustrous, yellowish-brown.** Native to North America; introduced into the Carpathians and rarely planted on moist stands.

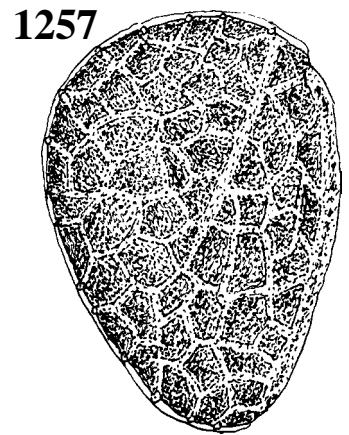
**1265. *Rosa caryophyllacea*** Besser — Shrub, up to 1 m high, thorns sharp, widespread at base, often coupled,



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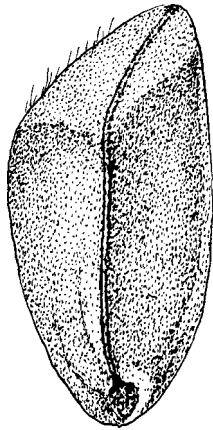


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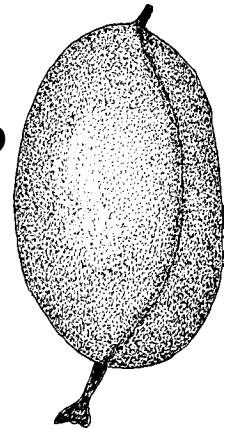


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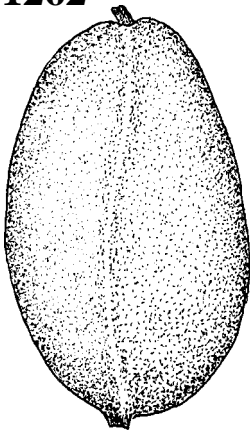
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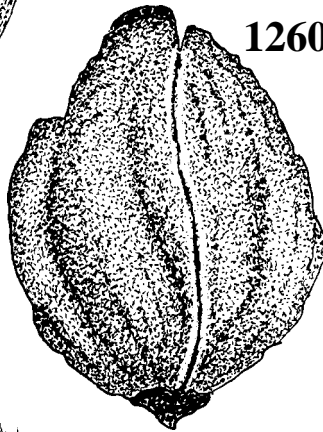
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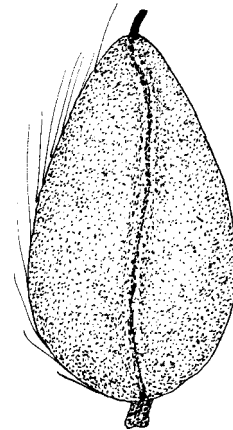
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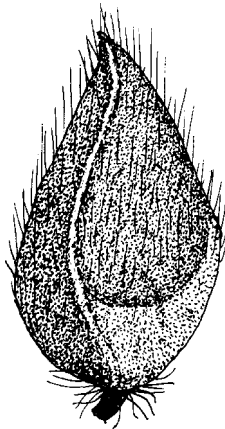
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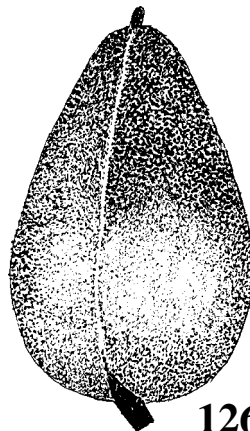
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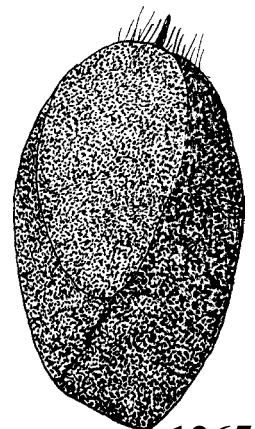
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1265



on flowering twigs bristly thorny. **Achenes oval, usually triangular, 4.5-5.5 x 3-3.5 mm. Surface mostly fine striate, lustreless, reddish-brown.  $2n = 35$ .** Native to Europe, on sunny shrubby slopes, vineyards, warmed, dry, stony grounds. Hu, Pl, Ro, Sk, Uk.

**1266. *Rosa centifolia* L.** — Shrub, up to 100 cm high, in some cvs higher, twigs rougher, leaves with serrate margins, flower full blossom. **Achenes ovoid, lateral compressed, apex acuminate or roundish, with a longitudinal furrow and a large scar, 4-5 x 2.5-3 mm. Surface fine waved and striate, scarletish red.  $2n = 28$ .** Native to the Caucasus region, perhaps very old hybrid (*Rosa gallica* x *phoenica*) or selection origin; a popular species in the Carpathians, cultivated in country gardens and cemeteries.

**1267. *Rosa chinensis* Jacq., *R. indica* Lindl.** — Tree, erect, up to 2 m high, prickles short, hooked, leaves simply, minutely serrate. **Achenes prolonged biconvex, on ventral side with a longitudinal furrow, apex acuminate, 5-5.6 x 2.7-3.1 mm. Surface smooth or indistinct shallow furrowed, faint lustrous, pinkish-yellow.  $2n = 14$ .** Originally growing in eastern Asia; since old times cultivated in gardens; mother species of many cvs with white, yellow, pink and red flowers.

**1268. *Rosa corymbifera* Borkh., *R. dumetorum* Thuill., *R. mollis* J. et C. Presl** — Shrub up to 2 m high, shoots abundantly ramified, thorns scarce, flattish, hookly curved. **Achenes prolonged biconvex, dorsal side convex, ventral rooflike with longitudinal ribs, apex narrowed, base rounded, 4.5-5.5 x 2.4-3 mm. Surface smooth or faint foveate, lustrous, pale reddish-brown.  $2n = 35$ .** Native to Eurasia, on woodland margins, scrubs, sandy pine woodlands, mostly in uplands of the whole Carpathians. Br, Mo, Pl, Ro, Sk, Uk.

**1269. *Rosa damascena* Mill.** — Shrub, shoots erect, thorns uniformed, strong, curved, flattish. **Achenes oblonged heart-shaped, dorsal side convex, ventral rooflike or flat with rib in the middle, apex narrowed, acuminate, base mighty, rounded, 5-6 x 2.5-3.2 mm. Surface smooth or very fine foveate, faint lustrous, reddish-brown.  $2n = 28$ .** Native to southwestern Asia; in Europe for long time cultivated for fragrant oil production, rarely as an ornamental. Hu, Ro, Uk.

**1270. *Rosa deseglisei* Boreau** — Shrub, up to 2 m high, prickles scattered, short, stout, compressed, strongly-hooked, leaflets broadly ovate, softly appressed-pubescent. **Achenes  $\pm$  pyramidal, mostly many-sides, angular, slight oval on base, apex narrowed, bottom broader, 4.2-5.2 x 2.7-3.3 mm. Surface longitudinal, shallow furrowed, smooth, yellowish or reddish-brown.** Mainly in central Europe; distribution not fully known. Br (?), Hu, Pl, Sk, Uk (?).

**1271. *Rosa dumalis* Bechst.** — Shrub, up to 2 m high, young twigs hoary, internodes short, prickles slight crooked or straight. **Achenes ovoid or ellipsoid, ventral side with suture, apex acute, bottom rounded, 5.5-6 x 2.5-3 mm. Surface slight furrowed or glabrous, apex hairy, violetish-brown.  $2n = 35$ .** Native to Europe, in light woods, shrubby slopes of mountain areas. Hu, Ro, Sk, Uk.

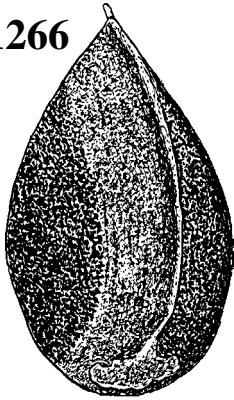
**1272. *Rosa elliptica* Tausch., *R. graveolens* Gren. et Godr.** — Shrub, up to 3 m high, stems without glandular setae, fruits glabrous. **Achenes heart-shaped, dorsal side convex, ventral rooflike, with a longitudinal rib, 4.5-5.5 x 3-3.6 mm. Surface smooth or fine colliculate, faint lustrous, around rib hairy, yellowish, pinkish, to dark-brown.  $2n = 35$ .** Native to central and southern Europe, on sunny shrubby slopes, dry, calcareous, stony grounds. Hu, Mo, Pl, Ro, Sk, Uk.

**1273. *Rosa foetida* J. Herm., *R. lutea* Mill.** — Shrub, up to 4 m high, shoots arcuate, numerous, thorns compressed, curved. **Achenes oblonged oval or ovate, pyriform, flat, dorsal side convex, ventral rooflike, apex mostly narrowed or truncate, 3.7-4.3 x 2.8-3.2 mm. Surface smooth or fine foveate, slight lustrous, yellowish-brown.  $2n = 28$ .** Originally growing in Asia Minor, often cultivated in parks, uniquely naturalized. Hu, Mo, Ro, Sk, Uk.

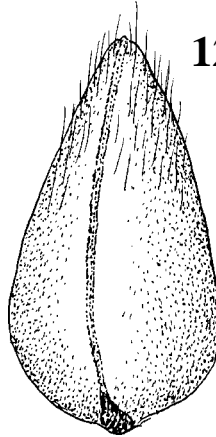
**1274. *Rosa gallica* L., *R. austriaca* Crantz, *C. rubra* Lam.** — Shrub, up to 40-120 cm high, shoots erect or procumbent, prickles with glands. **Achenes often triquetrous, dorsal side arched, ventral sides with a suture, 4.5-5.5 x 2.9-3.7 mm. Surface glabrous, shallow furrowed, orange, hilum whitish.  $2n = 28$ .** Native to Europe, in warmer uplands and lowlands, mostly along forest borders. Hu, Pl, Ro, Sk.

**1275. *Rosa glauca* Pourr., *R. rubrifolia* Vill.** — Shrub, up to 3 m high, shoots erect, at young stage hoary, later on brown. **Achenes prolonged ovoid with indistinct,**

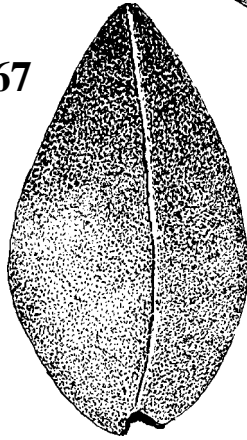
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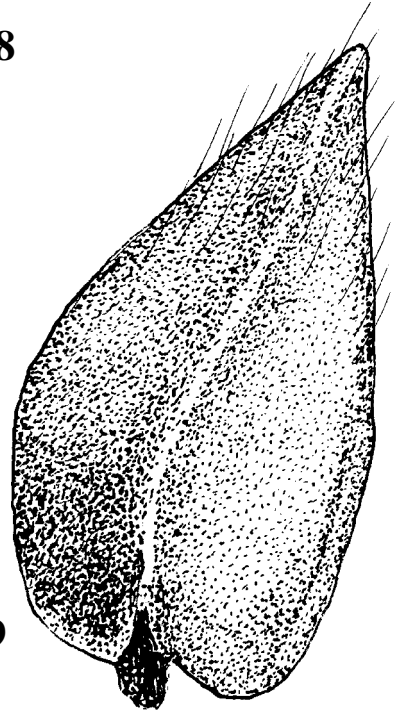
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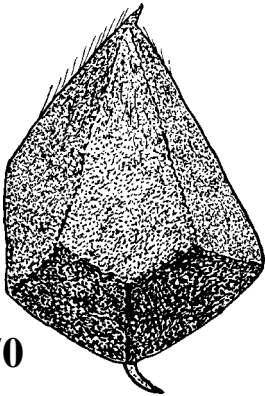
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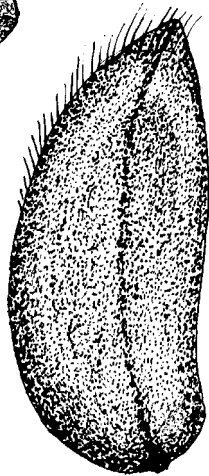
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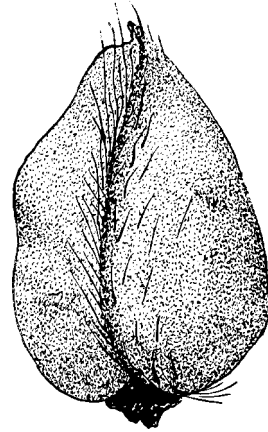
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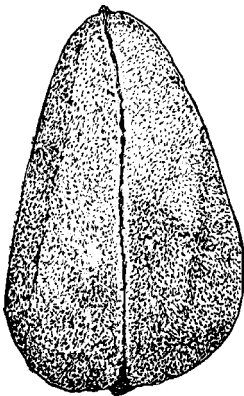
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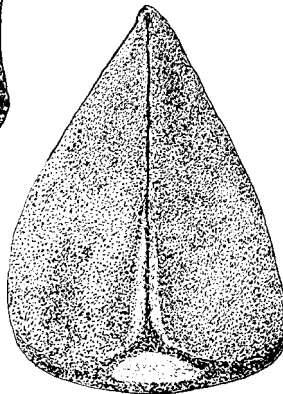
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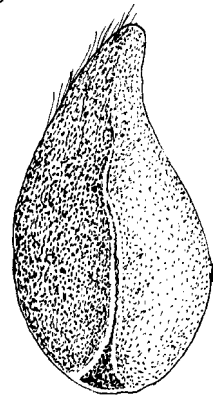
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1275



**rounded edges, apex hairy, 3.8-4.2 x 2.1-2.3 mm. Surface smooth, yellowish or pale-brown.  $2n = 35$ .** An European mountain species, in sunny scrubs, light scree forests, often cultivated in parks. Mo, Ro, Sk, Uk.

**1276. *Rosa inodora* Fr., *R. agrestis* var. *inodora* (Fr.) R. Keller** — Shrub, up to 3 m high, thorns curved or falcate, flowering twigs glanduliferous. **Achenes broad ovoid or ellipsoid, biconvex, suture hairy, 4.5-5.5 x 3-3.6 mm. Surface smooth or fine humped, light-yellow to brown.  $2n = 35$ .** Native to western and central Europe, extending to the Ukraine, on sunny slopes, scrubs, from upland to the alpine zone. Cz, Hu, Ro, Sk, Uk.

**1277. *Rosa majalis* J. Herrm., *R. cinnamomea* L.** — Shrub, up to 2 m high in dense stands, twigs thin, reddish-brown, thorns slender. **Achenes ovoid to pyriform, ventral side rooflike with a longitudinal suture, apex narrowed, acuminate, base rounded, 3.2-4 x 2-2.4 mm. Surface faint foveate, lustrous, reddish-brown.  $2n = 14$ .** Native to Eurasia, on sunny rocks and shrubby slopes, forest margins, often cultivated in parks and gardens. Hu, Mo, Pl, Sk.

**1278. *Rosa micrantha* Borrer ex Sm., *R. ferociformis* Prod.** — Shrub, stems up to 3.5 m high, internodes long, prickles curved. **Achenes mostly ovoid to triangular, bottom truncate, apex narrowed up to blunt acuminate, 3.8-4.2 x 2.5-2.9 mm. Surface longitudinal shallow furrowed, lustreless, pinkish-yellow.  $2n = 35$ .** Native to western, southern and central Europe, on overgrown rocks, shrubby slopes, forest margins. Hu, Mo, Pl, Ro, Sk, Uk.

**1279. *Rosa mollis* Sm., *R. villosa* auct. non L.** — Shrub, up to 1.5 m high, young stems usually pruinose, prickles slender, long, straight. **Achenes ovate to elliptic, biconvex, dorsal side dense hairy, ventral with a longitudinal furrow, lateral slight compressed, 4.7-5.3 x 2.5-2.9 mm. Surface smooth, glabrous, slight lustrous, yellowish.  $2n = 28$ .** Native mainly to northern and western Europe, extending locally as far as Br, Pl, Uk.

**1280. *Rosa moschata* Herrm.** — Perennial, robust evergreen, trailing, up to 12 cm high, thorns rare, firm, curved. **Achenes subovoid or conical, planoconvex, apex often with a remnant of the style, 4.8-5.3 x 2.6-3 mm. Surface smooth or fine-striate, lustreless, yellowish- or reddish-brown.  $2n = 14, 28$ .** Native to southern Asia; in the Carpathians cultivated

long ago in gardens for its large, single and aromatic flowers. Hu, Ro, Sk.

**1281. *Rosa multiflora* Thunb., *R. polyantha* Siebold et Zucc.** — Shrub, up to 2 m high, luxuriant, with long climbing twigs. **Achenes ovoid, pyriform with a distinct suture, 2.6-3.2 x 1.5-1.9 mm. Surface smooth, reddish with minute white spots.  $2n = 14$ .** Originally spread from southeastern Asia, a fundamental wild species of climbing roses; often cultivated in parks and gardens, mostly in climbing cvs (*R. polyantha* hort.). Hu, Mo, Ro, Sk, Uk.

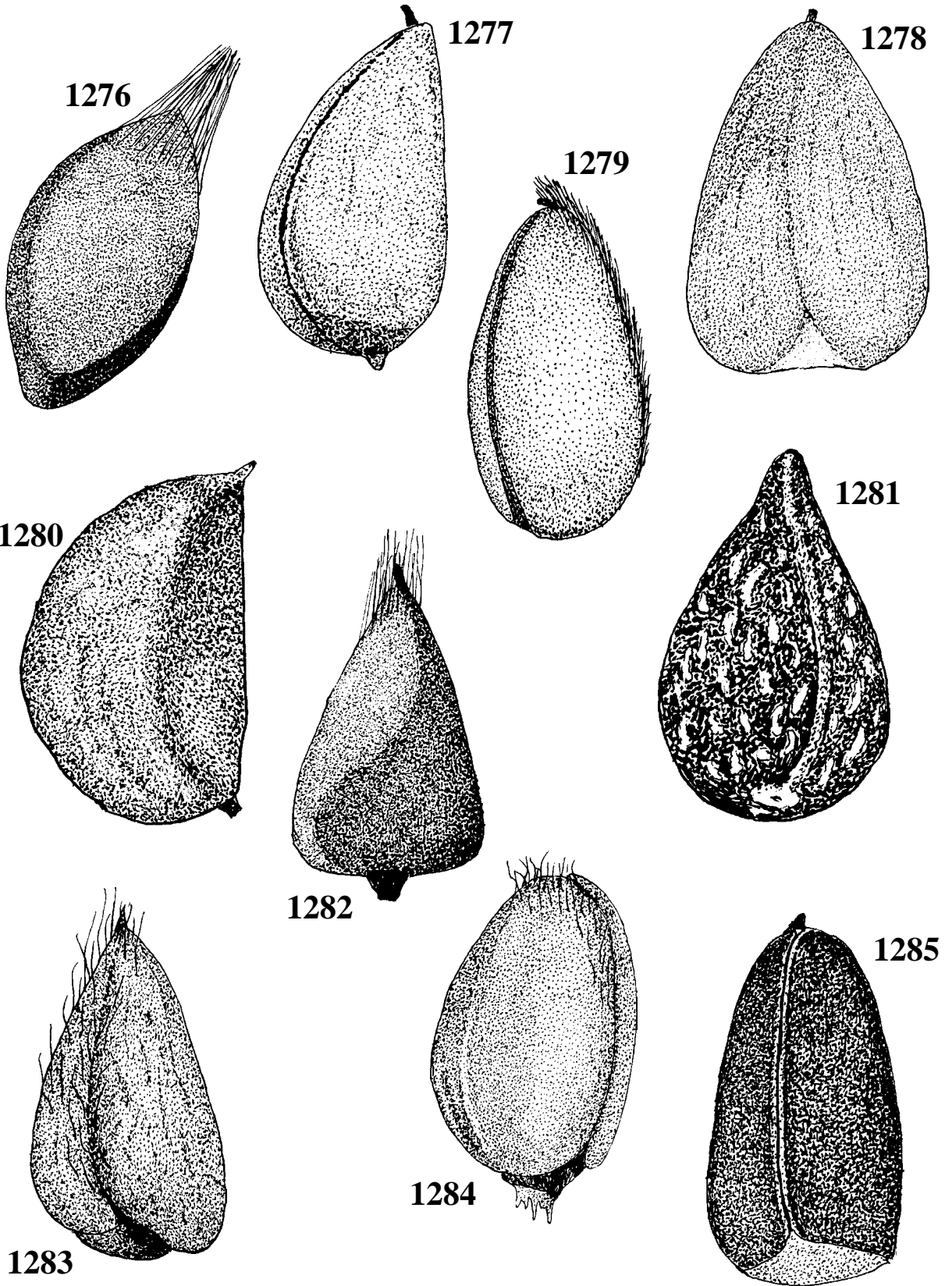
**1282. *Rosa nitidula* Ripart et Déséglise, *R. blondeana* Ripart et Déséglise** — Shrub, stems green, internodes long, prickles stout, curved or hooked. **Achenes mostly triangular, apex acuminate, bottom truncate, 4.7-5.1 x 2.8-3.2 mm. Surface shallow longitudinal furrowed, slight lustrous, pinkish-brown.  $2n = 35$ .** Native to Europe in lower-mountain areas, in waste places, gravel-stony denudations, shrubberies, in the whole Carpathians.

**1283. *Rosa obtusifolia* Desv., *R. tomentella* Léman** — Shrub, up to 2 m high, shoots richly branched, green, reddish, prickles sparsely, short, strong, compressed, hookly bended. **Achenes mostly conical with 3-4 walls, distinct ventral suture, apex with a thorny tip, 4.5-5.5 x 2.5-3 mm. Surface smooth or fine-striate, hairy, pale reddish-yellow.  $2n = 21, 35$ .** Native to Europe, in sunny shrubberies, along forest margins, boundaries. Hu, Mo, Pl, Ro, Sk.

**1284. *Rosa pendulina* L., *R. alpina* L.** — Shrub, up to 3 m high, decomposed, shoots erect, saggy, mostly without prickles. **Achenes ovoid, edges rounded, apex mostly acute, 4-5 x 2-3 mm. Surface slight lustrous, smooth, apex hairy, yellowish, elder seeds orange.  $2n = 28$ .** Native to mountains of central and southern Europe, in light forests, coastal thickets. Hu, Pl, Ro, Sk, Uk.

**1285. *Rosa pimpinellifolia* L., *R. spinosissima* L.** — Shrub, up to 1 m high, shoots erect in dense stand, prickles very abundant. **Achenes ovoid, faint compressed from sides, apex broad nearly flat, 4-6 x 2.4-3.2 mm. Surface lustrous, smooth, sometimes fine wrinkly, light- or dark-scarlet.  $2n = 18$ .** Native to Eurasia, extending as far as China and Korea, in warmer areas, on sunny stony slopes; an ornamental with flowers and black fruits. Hu, Pl, Mo, Ro, Sk, Uk.





**1286. *Rosa rubiginosa* L., *R. eglanteria* L.** — Shrub, up to 3 m high, shoots erect, prickles curved or falcate. **Achenes subelliptic, ventral side rooflike with a longitudinal suture, apex and base mostly narrowed, 3.5-4.2 x 2.6-3 mm. Surface dull or faint lustrous, dark reddish-brown. 2n = 35.** Native to Europe, on pastures, forest, forest edges, shrubby slopes in warmer part of the whole Carpathians. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**1287. *Rosa rugosa* Thunb., *R. regeliana* Lindley et André** — Shrub, low, switch, dense and dense pubescent twigs, with simple or full flowers, hips the biggest of the gender. **Achenes obovoid, mostly lateral compressed, dorsal side convex, ventral often rooflike, with a longitudinal furrow, 4.5-5 x 2.4-2.8 mm. Surface smooth, lustrous, yellowish or pale-brown. 2n = 14.** Native to the Far East (Kamchatka, Korea, Japan), mostly in the maritime zone; in the Carpathians cultivated for high vitamin C contents and used in food industry.

**1288. *Rosa scabriuscula* J. E. Sm.** — Shrub, up to 3 m high, scarcely branched, bare, thorns  $\pm$  erect, leaflets of the leaves felty or downy, sometimes dense pubescent, 2x serrate. **Achenes  $\pm$  ellipsoid, lateral flattish, 4.5-5 x 2.5-2.9 mm. Surface smooth or slight striate, lustreless, pale reddish-brown. 2n = 35.** Native to Europe, on shrubby slopes, sunny forest margins. Sk.

**1289. *Rosa sempervirens* L.** — Shrub, evergreen, shoots long, trailing, prickles scarce, curved, at base dilative. **Achenes mostly more or less pyramidal, two lateral sides flat (together rooflike-shaped), third convex, apex acuminate, more or less hairy, bottom rounded, 4-4.8 x 2.1-2.5 mm. Surface longitudinal shallow furrowed, dull, reddish-brown.** Native to southern Europe; in the Carpathians often cultivated in gardens and parks, as a trailing rose.

**1290. *Rosa serafinii* Viv.** — Shrub, up to 50 cm high, prickles hooked or falcate, rarely mixed with setae, fruits glabrous. **Achenes  $\pm$  pyriform, dorsal side convex, ventral mostly rooflike, with a longitudinal furrow, apex hairy, bottom  $\pm$  truncate, 4.4-4.9 x 2.2-2.5 mm. Surface shallow longitudinal furrowed, lustreless, pale to dark-brown.** Native to the Mediterranean region; in the Carpathians very rarely planted in parks.

**1291. *Rosa sherardii* Davies, *R. omissa* Déséglise** — Shrub, shoots dense branched, leaflets of leaves

conspicuously blue-green, tenderly tomentose on the beneath side. **Achenes ellipsoid, longitudinal suture on the ventral side, hairy at the apex, 4.8-5.4 x 3-3.4 mm. Surface fine wrinkly, slight lustrous, yellowish-brown. 2n = 35.** Native to Europe, in light woods, overgrown screes, forest margins, in calcareous, stony, warmed up places. Pl, Sk.

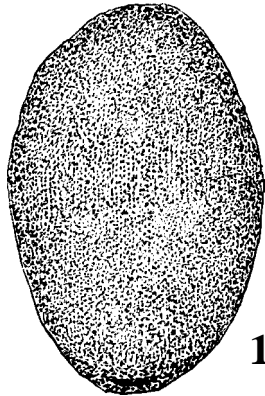
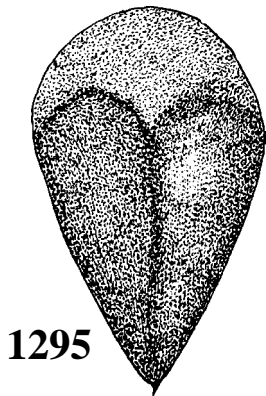
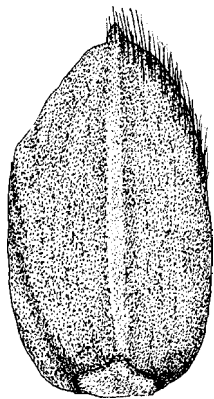
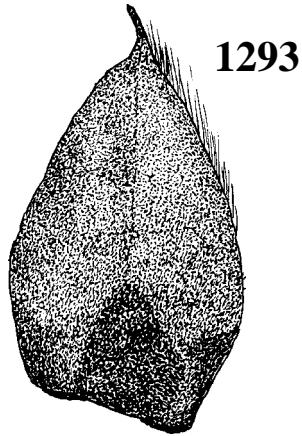
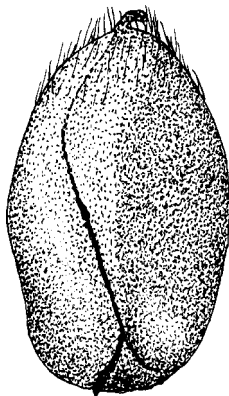
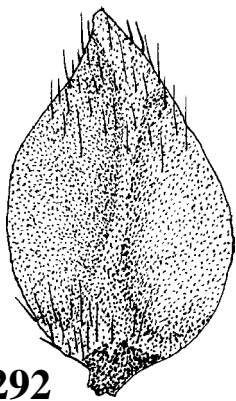
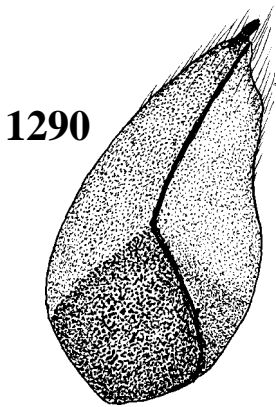
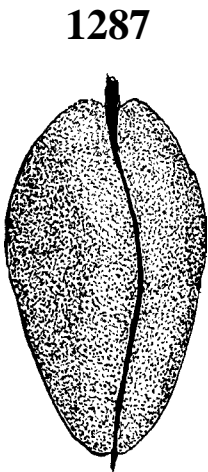
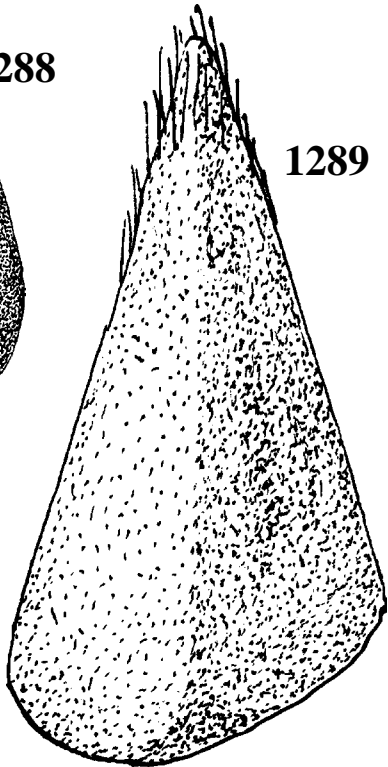
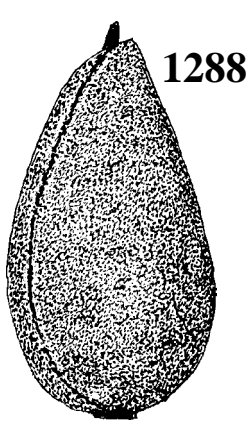
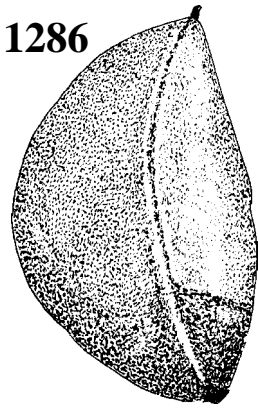
**1292. *Rosa stylosa* Desv.** — Vigorous shrub, shoots erect up to 3 m long, twigs crooked, richly thorny. **Achenes mostly oval or conical, suture on the ventral side, apex often with a remnant of the style, 5-6 x 3.5-4 mm. Surface waved, lustreless, apex and base hairy, cinnabar. 2n = 35, 42.** Native to Europe, shrubbery and deciduous forest margins of lowlands. Hu, Ro.

**1293. *Rosa subcanina* (Christ) Dalla Torre et Sarnth., *R. glauca* Vill. subsp. *subcanina* (Christ) Hayek** — Shrub, up to 2 m high, young twigs hoary, internodes long, thorns curved, flower stalks 20-30 mm long, longer than the hip. **Achenes  $\pm$  ovoid, transverse section triangular, apex narrowed and pointed, bottom truncate, 4.7-5 x 3.1-3.5 mm. Surface smooth or slight grooved, faint lustrous, one side hairy, reddish-yellow. 2n = 35.** Native to Europe; light woods of the montane zone. Hu, Ro, Sk.

**1294. *Rosa tomentosa* J. E. Sm., *R. subglobosa* Sm.** — Shrub, up to 2 m high, dense ramified, shoots saggy, internodes long. **Achenes elliptic to ovoid, apex attenuate, base truncate, 4.2-4.6 x 2.3-2.6 mm. Surface slight lustrous, fine wrinkly, apex on one side hairy, yellow to orange. 2n = 35.** Native to the most part of Europe and southwestern Asia, in stony places, slopes, scrubs, along forest margins. Hu, Mo, Pl, Ro, Sk, Uk.

**1295. *Rosa turbinata* Ait.** — Shrub, twigs scarcely, flowering twigs thornless, leaves with 5 leaflets. **Achenes obovoid, ventral side with suture, apex rounded, bottom often gradually narrowed, apiculate, 5.2-5.8 x 3-3.4 mm. Surface smooth or shallow furrowed, slight lustrous, reddish-brown. 2n = 35, 40.** Place of origin unknown, perhaps a hybrid (*R. majalis* x *gallica*), since ancient times cultivated, uniquely naturalized. Ro, Sk, Uk.

**1296. *Rosa turcica* Rouy, *R. ferox* M. Bieb.** — Small shrub, markedly ramified and thorned, thorns unequal, arcuate. **Achenes oval or conical, ventral side with suture, apex with rest of the style, 4-5 x 2.7-3.3 mm. Surface smooth, slight lustrous, yellow**



or yellowish-brown. Native to Eurasia, rare in sunny arid localities. Hu, Ro.

**1297. *Rosa ucrainica*** Chrshan. — Shrub, 30-40 cm high, stems and twigs thornless. **Achenes  $\pm$  pyramidal or ellipsoid, two ventral sides flattish, rooflike, with longitudinal suture, third dorsal side convex, 5.3-5.9 x 3.3-3.7 mm. Surface slight foveolate and shallow furrowed, slight lustrous, orange-brown.** Native to eastern Europe, on steppe slopes, ravines, gorges. Mo, Uk.

**1298. *Rosa villosa* L., *R. pomifera* Herm.** — Shrub, up to 1.5 m high, densely ramified, twigs with short internodes, not pruinose, hoarless, thorns thin, straight, inflated at the base. **Achenes mostly ellipsoid, dense hairy at the apex, 4.6-5.2 x 2.8-3.2 mm. Surface shallow furrowed, slight lustrous, pinkish-brown.  $2n = 28$ .** Native to southern Europe; in the Carpathians often cultivated as (Apple rose) in parks, fruit with high contents of vitamins. Mo, Ro, Sk.

**1299. *Rosa virginiana* J. Herm.** — Shrub, up to 2 m high, shoots  $\pm$  without suckers, dark-green, reddish-brown later on. **Achenes ovoid to pyriform, apex attenuate with an expressive style-scar and suture, 3.7-4.5 x 1.8-2.4 mm. Surface smooth, yellow to orange.  $2n = 28$ .** Originally spread from North America; in the Carpathians cultivated in parks as an ornamental, locally naturalized. Hu, Sk.

**1300. *Rosa vosagiaca* Desp., *R. afzeliana* Fr.** — Shrub up to 2 m high, young shoots hoary, internodes long, thorns short, curved. **Achenes ovoid, ventral side with a longitudinal suture, apex narrowed acuminate, base rounded, 6-7 x 2.5-3 mm. Surface faint foveolate, slight lustrous, sides near apex hairy, pale reddish-brown.  $2n = 35$ .** Native to northern Europe and Asia Minor, in light and shrubby woodlands, overgrown screes. Hu, Ro, Uk.

**1301. *Rosa x jundzillii* Besser, *R. trachyphylla* Rau, *R. livescens* Besser** — Shrub, up to 2 m high, shoots erect, thorns slender, erect or slight curved **Achenes with three and more edges and areas, 4.5-6 x 3-3.5 mm. Surface smooth or barely humpy, hairy on upper and dorsal part, orange.  $2n = 28, 42$ .** Hybrid origin (*Rosa canina* x *gallica*). An Euro-Siberian element, on sunny scrubs, light forests, open slopes in lowlands and mountains. Hu, Pl, Ro, Sk, Uk.

**1302. *Rosa x zalana* Wiesb., *Rosa carryophyllacea* Besser var. *zalana* (Wiesb.) J. B. Keller et all.** — Shrub, robust, up to 250 cm high, twigs arcuately crooked, thorny, flowers pink. **Achenes often angular, mostly lateral slight compressed, apex acuminate, hairy, bottom often truncate, 5-6 x 3.5-4 mm. Surface waved, dull, yellowish or reddish.  $2n = 35$ .** Hybrid origin (*Rosa gallica* x *canina*). Native to central Europe, scattered or to scarce on boundaries, sunny slopes and pastures, wood margins, desolate vineyards, up to 800 m. Hu, Pl, Ro, Sk.

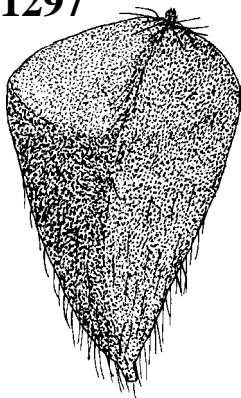
**1303. *Comarum palustre* L., *Potentilla palustris* (L.) Scop.** — Perennial, rhizome creeping, woody, long, with a leafy rosette and flowering stems, 15-45 cm high. **Achenes rounded ovoid, slight, flattish, 13-15 x 1-1.2 mm. Surface glabrous, slight lustrous, yellowish to dark-brown.  $2n = 42$ .** Euro-Siberian and North America plants, on moorlands, fens or marshes, in acid, occasionally submerged soils. Br, Hu, Pl, Ro, Sk, Uk.

**1304. *Dasiphora fruticosa* (L.) Rydb., *Potentilla fruticosa* L.** — Shrub, stems and twigs woody, richly and dense ramified, more than 1 m high, downy, leaves petiolate, 5-7-pennate, rarely ternate. **Achenes prolonged ovoid, obclavate, apex narrowed with long white hairs c. 3-4x and carpel 4-5x as long as achene, bottom broad, rounded, hilum on ventral side, 1.2-1.4 x 0.6-0.8 mm. Surface undulate, slight lustrous, glabrous, dense covered with long hairs, pale-brown.  $2n = 28$ .** Native to Eurasia and North America; in the Carpathians often cultivated as an ornamental in parks, locally rarely naturalized.

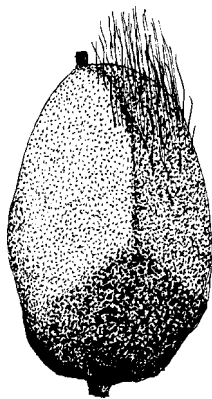
**1305. *Potentilla alba* L.** — Perennial, stem decumbent to erect, flowering 5-15 cm high, pubescent. **Achenes slight compressed, ovoid or conical, hairy around hilum, sometimes also on ventral suture hairy, 1.6-2 x 1.2-1.4 mm. Surface distinct veinous, smooth, ochre-yellow.  $2n = 28$ .** Native to central and eastern Europe, on dry thickets, hedgerows and open, dry woodlands; in all Carpathian territories.

**1306. *Potentilla anglica* Laichard., *P. procumbens* Sibth, *Tormentilla reptans* L.** — Perennial, rhizome coarse with terminal leaf rosette, procumbent stems 15-50 cm long. **Achenes ovoid, lateral compressed, 1.3-1.7 x 1-1.2 mm. Surface dull, glabrous, rugose-ribbed and scarce tuberculate, orange-brown.  $2n = 56$ .** Native to western and central Europe, in

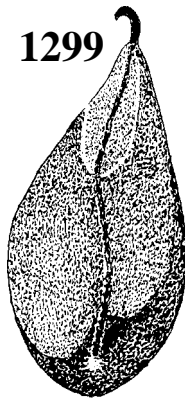
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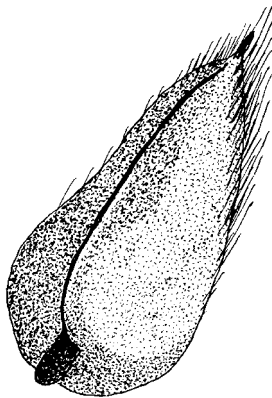
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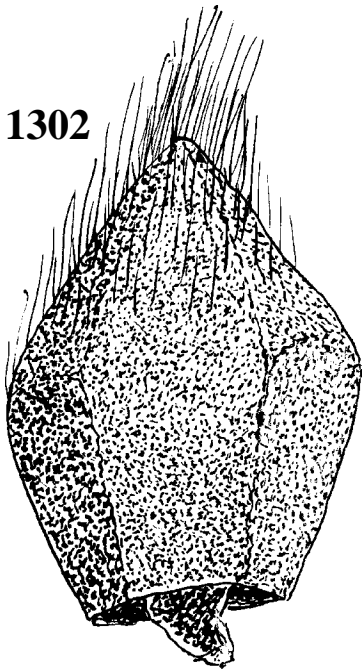
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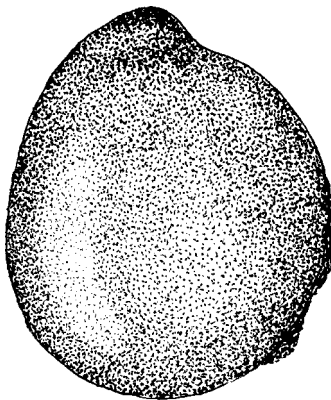
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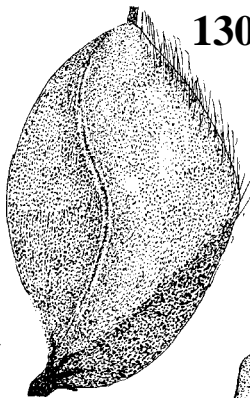
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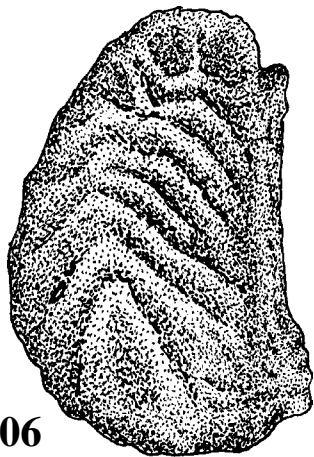
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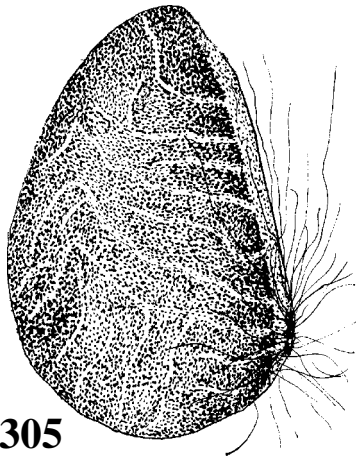
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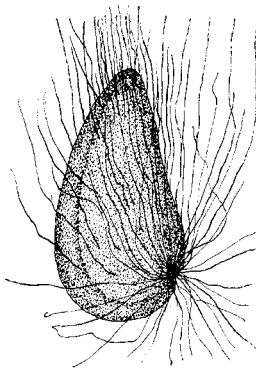
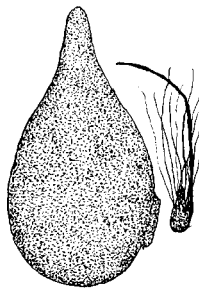
1306



1305



1304



moist meadows, forest margins and clearances, pond banks. Pl, Ro, Sk.

**1307. *Potentilla anserina* L., *Argentina anserina* (L.) Rydb.** — Perennial, stems creeping or decumbent, 15-60 cm long, leaves with many leaflets. **Achenes ovoid, slight flattish, dorsal side with an indistinct suture, apex and base obtuse, 1.6-2.2 x 1.3-1.5 mm. Surface dull, glabrous, fine undulate, reddish-brown. 2n = 28, 35, 42.** Native to the most part of Eurasia, on way sides, embankments, wastelands, riverbanks, pond margins, barren soils; in the whole Carpathians.

**1308. *Potentilla arenaria* Borkh., *P. cinerea* Chaix ex Vill., *P. glaucescens* Willd.** — Perennial, pillowly tufted, rhizome ramified, creeping, flowering stems up to 10 cm high. **Achenes ovoid, slight compressed, 1-1.2 x 0.8-1 mm. Surface dull, glabrous, distinct veinous, slight tuberculate, brown. 2n = 28.** Native to Europe in lowland and upland dry pastures, sands, rocks, steppe slopes; in all Carpathian territories.

**1309. *Potentilla argentea* L.** — Perennial, flowering stems 10-30 cm, ascendent, up to erect, downy. **Achenes ovoid, flattish, dorsal side with a distinct ridge, apex and base obtuse, 0.8-1 x 0.5-0.7 mm. Surface dull, glabrous, usually indistinct rugose-ribbed, orange-brown. 2n = 14.** Native to the mountains of central and southern Europe, on roadsides, banks, barren sandy or stony soils. Hu, Mo, Pl, Ro, Sk, Uk.

**1310. *Potentilla astracanica* Jacq., *P. danubialis* Prod.** — Perennial, stem 10-30 cm high, basal part roughed. **Achenes ± spherical or reniform, with hilum in the middle of the ventral side, lateral slight compressed, margin with a narrow hem, 1.1-1.3 x 1.4-1.6 mm. Surface ribbed-furrowed, lustreless, brown.** Native to southern Europe, Asia Minor, the Caucasus, in dry, shrubby, arid localities, maritime sands. Mo, Ro, Uk.

**1311. *Potentilla atrosanguinea* Lodd.** — Perennial, stems erect, much branched, 30-40 cm high, leaves three to four, flowers dark-pink to bloody red. **Achenes semirounded, lateral compressed, dorsal side convex, with a large hilum, 1.5-1.8 x 1-1.2 mm. Surface ribbed-furrowed, faint lustrous, brown.** Native to the Himalayas; in the Carpathians cultivated as an ornamental in gardens.

**1312. *Potentilla aurea* L., *P. halleri* Ser., *Fragaria aurea* (L.) Crantz** — Perennial, tufted, non-glandular, stems ascendent, hirsute above, 5-30 cm high. **Achenes ovate to reniform, sometimes near rounded, with ridge on the dorsal side, 1.2-1.5 x 0.8-1.2 mm. Surface dull, smooth, fine longitudinal veinous, greenish-brown to brown. 2n = 14.** Native to the mountains of Europe, in grassland and rocky places, usually at the elevation of 1400-2600 m, calcifuge. Pl, Ro, Sk, Uk.

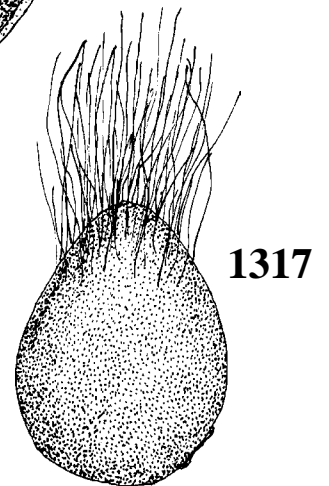
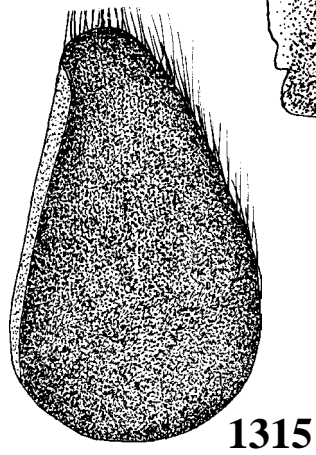
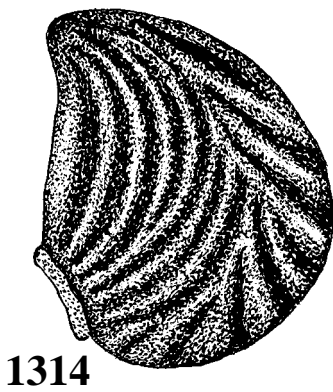
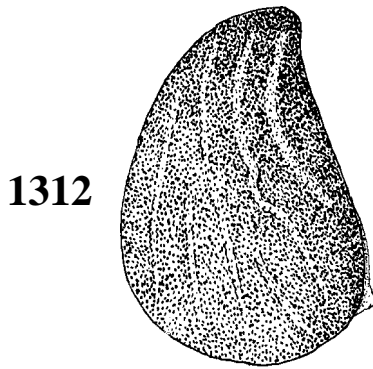
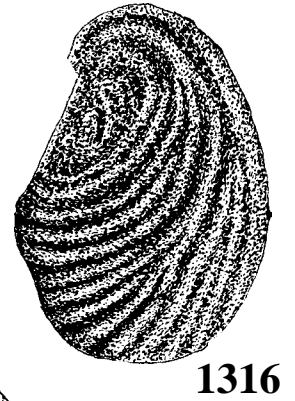
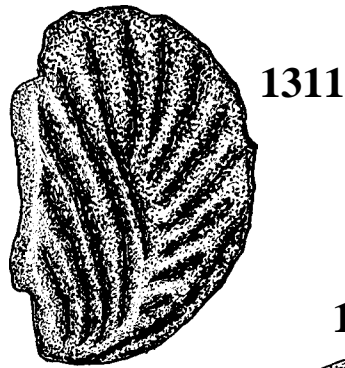
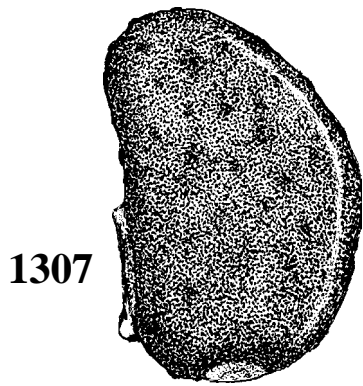
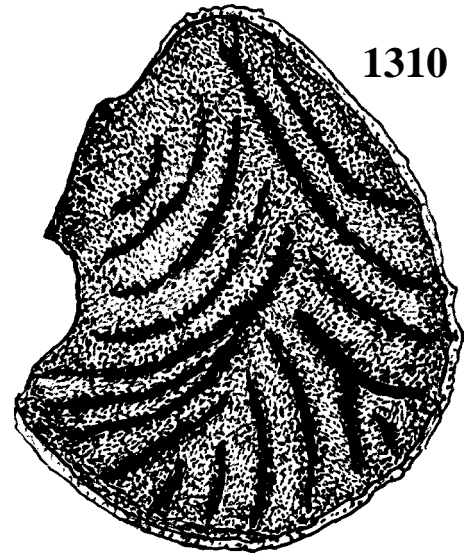
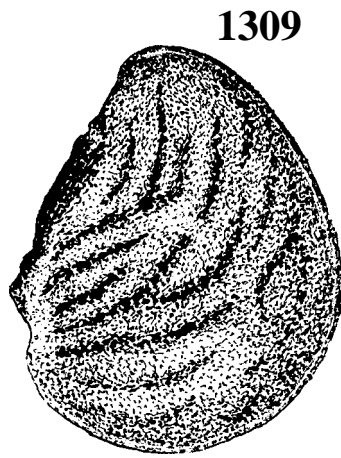
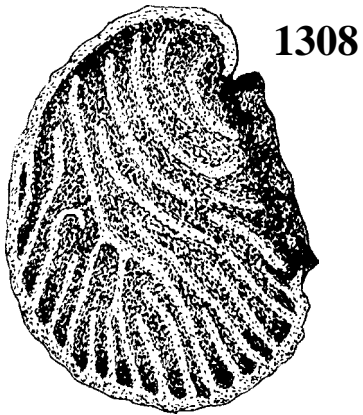
**1313. *Potentilla bifurca* L., *P. bifida* Pall.** — Perennial, semishrubs, procumbent or ascendent, up to 25 cm high, stems and twigs woody, ramified from the base. **Achenes slight flattish ovoid, dorsal side with a narrow suture, hilum in the upper part of the ventral side, 1.3-1.5 x 1-1.2 mm. Surface distinct ribbed on lateral sides, smooth, slight lustrous, dark-brown.** Native to Eurasia, on steppes, dry stony slopes, sandy meadows, fields, fallows, rarely cultivated in gardens as a decorative. Ro.

**1314. *Potentilla brauniana* Hoppe, *P. dubia* (Crantz) Zimm., *P. minima* Haller fil.** — Perennial, flowering stems up to 2-5 cm high, lateral, ascending, sparsely hairy. **Achenes broad subovoid, slight compressed, dorsal side rounded with longitudinal ribs in the middle, ventral side rooflike with expressive hilum at the bottom, 1.3-1.5 x 1.1-1.3 mm. Surface distinct furrowed, faint foveolate, brown. 2n = 14.** Native in mountains of west Europe; its occurrence in the southeastern Carpathians dubious. Ro.

**1315. *Potentilla caulescens* L.** — Perennial, stems ascendent, 10-30 cm high, hirsute. **Achenes slight lateral compressed ovoid, suture on ventral side, apex sometimes hairy, 1.3-1.5 x 0.7-0.9 mm. Surface smooth, slight lustrous, yellowish-brown.** Native to Europe, in slits of calcareous rocks in the alpine zone. Ro.

**1316. *Potentilla chrysantha* Trev.** — Perennial, stems thin, ascendent, 15-40 cm high, little leafed, ramified above, glandular and hirsute. **Achenes ovoid, slight lateral compressed, hilum in the upper part of the ventral side, 1.4-1.6 x 1-1.1 mm. Surface distinct and dense ribbed, glabrous, brown.** Native to Eurasia, on forest margins and clearings, shrub-beries, meadows, grassy slopes. Ro.

**1317. *Potentilla clusiana* Jacq., *Fragariastrum clusianum* (Jacq.) Schur** — Perennial, stems 3-8 cm high, ascendent, with one to three flowers. **Achenes**



**ovoid, apex narrowed, rounded, sometimes curved on one side, with long white hairs, base rounded on one side, with hilum, 1.3-1.7 x 0.9-1.1 mm. Surface faint foveolate, lustreless, brown. 2n = 42.** Native to the Alps, on limestone rocks, rare in the Carpathians. Ro, Sk.

**1318. *Potentilla collina*** Wibel, *P. wibeliana* Th. Wolf — Perennial, stems procumbent up to ascendent, 10-30 cm high. **Achenes ovoid, slight flattish, with an indistinct ridge on dorsal side, 1.1-1.3 x 0.9-1 mm. Surface dull, glabrous, fine longitudinal venous, brown. 2n = 42.** Native to central Europe, on sand-grassy slopes, forest margins ways, banks. Hu, Pl, Ro, Sk, Uk.

**1319. *Potentilla crantzii*** (Crantz) G. Beck ex Fritsch, *P. alpestris* Hall. fil. — Perennial, flowering stems 10-30 cm high, thin, ascendent. **Achenes broad ovoid to oval, with a distinct hilum on ventral side, 1.5-1.7 x 1-1.3 mm. Surface dull, distinct venous, dark-sandy. 2n = 28, 42.** Native to the mountains of central and southern Europe, on open rocky grounds, stout screes and grassy meadows, in the subalpine zone. Pl, Ro, Sk, Uk.

**1320. *Potentilla dissecta*** (Wallr.) Zimmer — Perennial, stems 10-40 cm high, ascending, leaves on the upper part felty, grey up to white, beneath downy, greyish-white, flowers small. **Achenes ± obovoid, lateral slight compressed, hilum large, 1.3 -1.5 x 1-1.2 mm. Surface with some pale ribs or smooth, lustreless, light-brown.** Native to the Carpathians, on sunny stony slopes and warmer places, scarce. Sk.

**1321. *Potentilla erecta*** (L.) Räuschel, *P. sylvestris* Neck., *P. tormentilla* (Stokes) Neck. — Perennial, stem prostrate to erect, 10-50 cm long, downy. **Achenes ovoid, lateral flattish, distinct ridge on dorsal side, apex and base obtuse, 1.6-1.9 x 1.1-1.3 mm. Surface dull, glabrous, rugose-ribbed and often sparse tuberculate, orange-brown. 2n = 28.** Native almost throughout Europe and Siberia, in pastures, fields, meagre dry meadows, light forests. Br, Hu, Pl, Ro, Sk, Uk.

**1322. *Potentilla heptaphylla*** L., *P. opaca* L. — Perennial, rhizome thin, tufted, flowering stems up to 25 cm, thin, reddish, hirsute. **Achenes ovoid to lunate, lateral flattish, distinct ridge on dorsal side, with distinct hilum on ventral side, 1.3-1.7 x 1-1.3 mm. Surface dull, glabrous, rugose-ribbed, brown. 2n = 14.** Native to central Europe, on dry,

low grassy stands, slopes, ditches, rocks in lowlands and uplands. Hu, Pl, Ro, Sk, Uk.

**1323. *Potentilla hirta*** L. — Perennial, stems erect, rusty coloured, 20-30 cm high, leaves consist of 5-7 leaflets. **Achenes obovoid or reniform, with semi-transparent wing all around the seed or on one part of it, 1.6-2 x 1.2-1.4 mm. Surface much and distinct venous, dull, dark-brown, veins pale-brown.** Native to the Mediterranean region, on loamy and rocky non-cultivated stands, growing on lowlands up to subalpine zones. Ro, Sk, Uk.

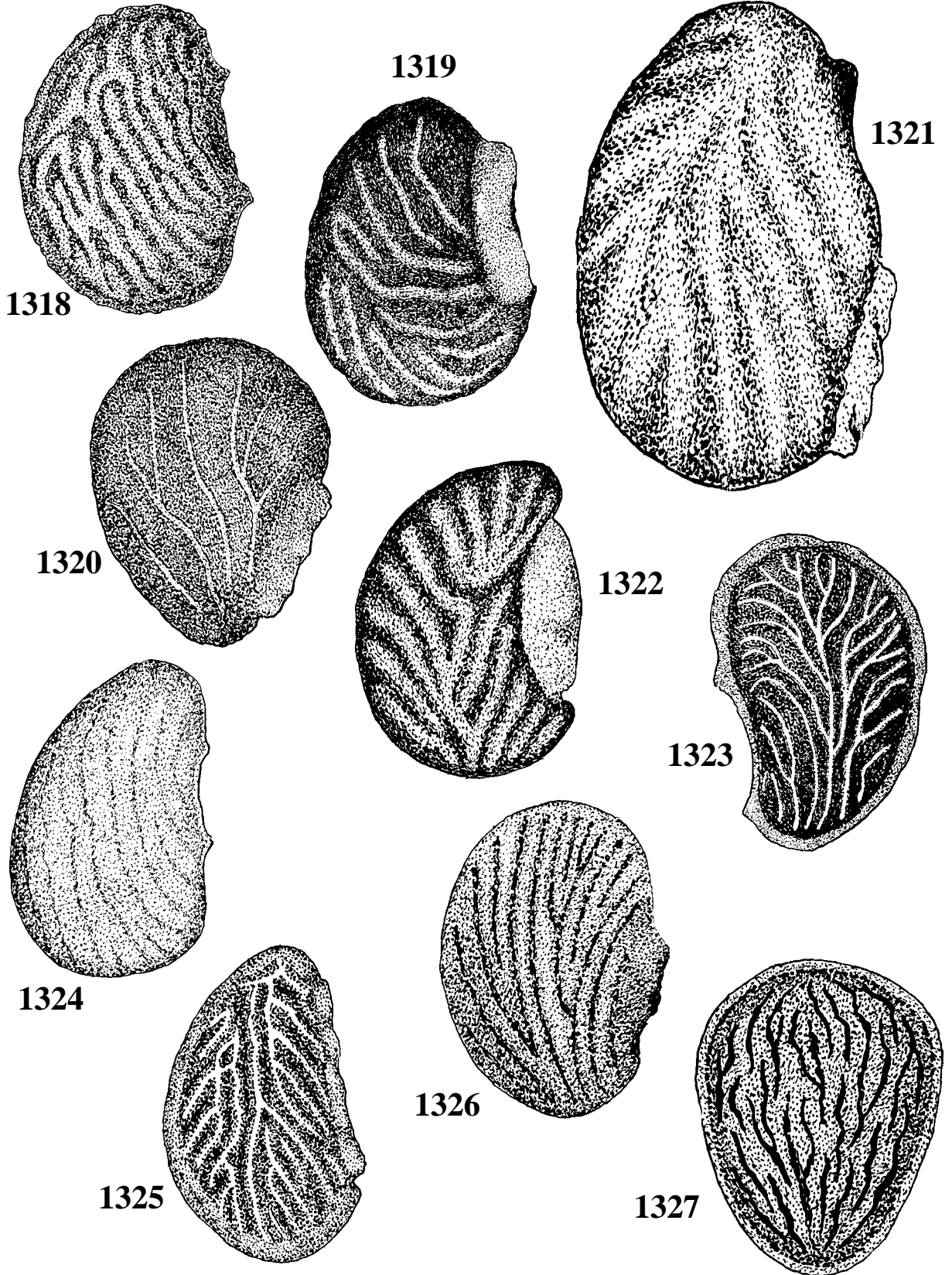
**1324. *Potentilla impolita*** Wahlenb., *P. cinerea* Raf. non Chaix — Perennial, stems arcuate, 10-30 cm high, white or greyish tomentose. **Achenes ovoid, compressed, apex ± truncate, large hilum on ventral side, 0.9-1.1 x 0.6-0.7 mm. Surface arcuate ribbed, smooth, lustreless, brown.** Native to Euro-Siberia, in dryer meadows, hills and slopes, light forests and their margins, fields, fallows. Hu, Mo, Ro, Sk, Uk.

**1325. *Potentilla inclinata*** Vill., *P. adscendens* Waldst. et Kit. — Perennial, stems erect or ascending, 15-60 cm high, downy. **Achenes ovate in outline, lateral compressed, with a distinct hyaline keel around the seed, 1.2-1.4 x 0.6-0.9 mm. Surface dull, glabrous, rugose-ribbed, brown. 2n = 42.** Native to Eurasia, on steppe meadows and pastures, overgrown rocks and ways, damp places. Hu, Mo, Ro, Sk, Uk.

**1326. *Potentilla intermedia*** L., *P. canescens* Besser — Biennial or perennial, flowering stems 20-50 cm high, ascending, from half branched, richly leafy, bristle on base, shaggy above. **Achenes ± ellipsoidal, lateral compressed, ribs broader than furrows, dorsal side narrowly winged, 1-1.2 x 0.7-0.8 mm. Surface striate, lustreless, pale-brown. 2n = 28.** Native to Eurasia, on calcareous, moist stands, forest margins, in upland and montane zones. Pl, Ro, Sk, Uk.

**1327. *Potentilla leucopolitana*** P. J. Müller — Perennial, stems procumbent, ascending, 10-20 cm high, white tomentose. **Achenes obovoid, lateral slight compressed, margin with a narrow wing, 0.9-1.1 x 0.7-0.9 mm. Surface longitudinal furrowed, lustreless, pale-brown.** Native to Eurasia, in light-sandy woods, along rivers, sandy hills and dunes, on moister and dryer localities. Hu, Ro, Sk, Uk.





**1328. *Potentilla micrantha*** Ramond ex DC., *P. breviscapa* Vest — Perennial, flowering stems 5-20 cm high, dense downy, with long hairs. **Achenes ovoid, lateral flattish, distinct ridge on dorsal side, apex rounded, base obtuse, 1.3-1.5 x 0.9-1.1 mm. Surface dull, glabrous, minute rugose-ribbed, brown. 2n = 14.** A Mediterranean element, in light deciduous forests, at streams, stony slopes, meagre meadows, in the montane zone. Hu, Mo, Ro, Sk, Uk.

**1329. *Potentilla neglecta*** Baumg., *P. impolita* auct. non Wahlenb. — Perennial, flowering stems up to 50 cm high, erect, leaves on the beneath side white felty, with 9-11 acuminate teeth. **Achenes ± reniform, dorsal side rounded, ventral ± flattish, with the hilum in the middle, 1-1.2 x 0.6-0.75 mm. Surface shallow furrowed, faint lustrous, pale-brown. 2n = 42.** Native to Europe; rare in warmer areas of the Carpathians.

**1330. *Potentilla nitida*** L. — Perennial, stems up to 5 cm high, a tiny high mountain plant, all silky pubescent, three-piece leaves, silverish and pinkish. **Achenes crooked ovoid, apex blunt acuminate, dense hairy from the bottom, 1.6-1.8 x 0.9-1.1 mm. Surface glabrous, faint lustrous, brown to purplish-brown.** Native the southern and eastern Alps; in the Carpathians cultivated in rock-gardens.

**1331. *Potentilla norvegica*** L., *P. fragariifolia* Hoppe, *P. trifoliata* Gilib. — Annual or perennial, flowering stems ascendent up to erect, 10-70 cm high, richly leafy. **Achenes ovoid to broad ovoid, lateral compressed, with a ridge on dorsal side, apex and base obtuse, 0.8-1 x 0.6-0.8 mm. Surface dull, glabrous, strong rugose-ribbed, brown. 2n = 70.** Native to northern, central and eastern Europe, on sandy banks of ponds, moist roads and waste grounds. Br, Pl, Ro, Sk, Uk.

**1332. *Potentilla obscura*** Willd., *P. recta* L. var. *obscura* Koch — Perennial, whole plant sparsely pubescent with long hairs, stems 30-70 cm high, later reddish, lower leaves with 5-7 leaflets. **Achenes obovoid or reniform, lateral slight flattish, 1.4-1.6 x 1.1-1.2 mm. Surface veinous or ribbed, dull, dark-brown, ribs pale.** Native to Eurasia, the Asia Minor, western Siberia, on dry hills, slopes and shrubberies. Ro, Uk.

**1333. *Potentilla patula*** Waldst. et Kit. — Perennial, flowering stems 20-60 cm, hirsute, stock slender,

tufted. **Achenes obovoid, lateral flattish, distinct keel around the achene near the hilum, 1.2-1.4 x 0.8-1 mm. Surface dull, glabrous, rugose-ribbed, brown. 2n = 28, 42.** Dry, open grasslands, in the lowlands of central and eastern Europe. Hu, Mo, Ro, Sk, Uk.

**1334. *Potentilla pedata*** Willd. ex Nestl., *P. hirta* auct. non L. — Perennial, plant similar to *P. recta*, stems erect, with pinkish tinge, 20-30 cm high. **Achenes reniform, lateral compressed, with a distinct narrow brim, prolonged hilum on ventral side with hem about mound, 1.4-1.6 x 0.9-1.1 mm. Surface distinct ribbed and furrowed, lustreless, dark-brown, ribs paler.** Native to southern Europe, on loamy and shady stands, non-cultivated soils, in upland and subalpine zones. Hu, Mo, Ro, Sk, Uk.

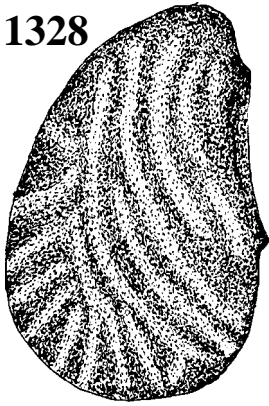
**1335. *Potentilla recta*** L., *P. semilaciniosa* Borbás — Perennial, flowering stems 10-70 cm, dense downy and glandular. **Achenes obovoid, compressed, dorsal margin with a conspicuous hyaline wing, apex and base obtuse, 1.3-1.7 x 1.9-1.1 mm. Surface dull, glabrous, longitudinal rugose-ribbed, dark-brown. 2n = 42.** Native to Eurasia and northern Africa, on meadows, pastures, in wet and shady places. Br, Hu, Pl, Mo, Ro, Sk, Uk.

**1336. *Potentilla reptans*** L., *P. anomala* Ldb. — Perennial, stems 30-100 cm high, decumbent, rooting down on knots, hirsute. **Achenes obovoid, lateral compressed, small hilum on ventral side, 1.1-1.3 x 0.7-0.9 mm. Surface indistinct veinous and scarce humped on dorsal and lateral sides, lustreless, dark-brown. 2n = 28.** Native to Eurasia, on wet meadows, slopes, grassy places along roads, ditches; in all Carpathian territories.

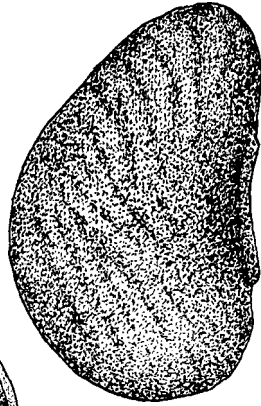
**1337. *Potentilla rupestris*** L. — Perennial, stems erect, up to 30-50 cm high, branched above, with articular glands, basal leaves simple, oval-lanceolate, undivided. **Achenes oblonged obovoid, lateral slight flattish, hilum on the bottom part, 1.2-1.4 x 0.5-0.6 mm. Surface undulate, slight lustrous, pale-brown. 2n = 14.** Native to Europe, western Asia, North America, in the montane zone, in rocky crevices, on dryer hills. Br, Hu, Pl, Ro, Sk.

**1338. *Potentilla sterilis*** (L.) Garcke, *Fragaria sterilis* L. — Perennial, flowering stems 5-15 cm high, downy non-glandular. **Achenes obovoid, lateral compressed, apex rounded, bottom narrowed, large hilum on ventral side, 1.5-1.7 x 1.1-1.2 mm.**

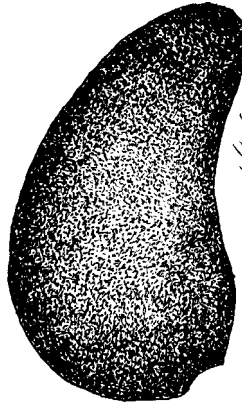
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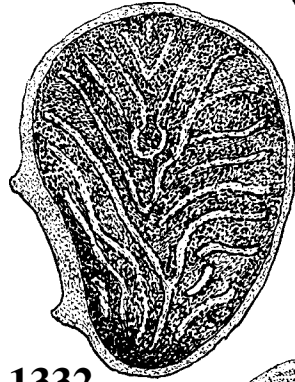
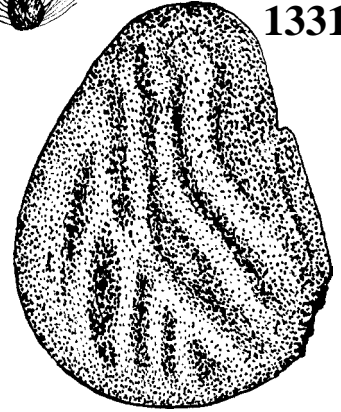
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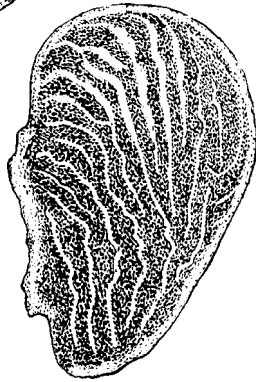
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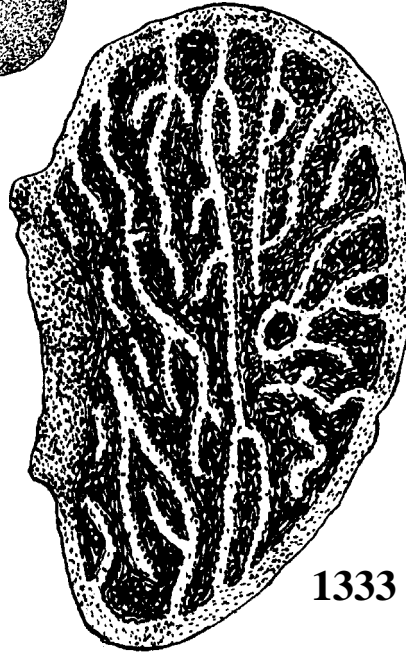
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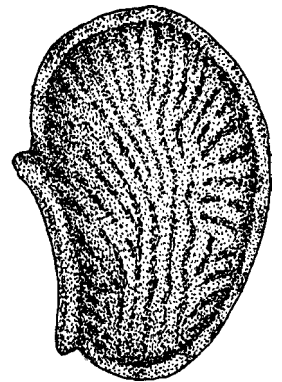
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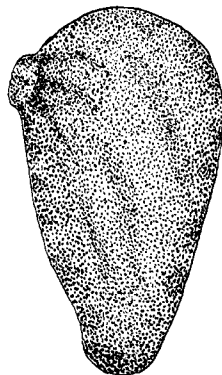
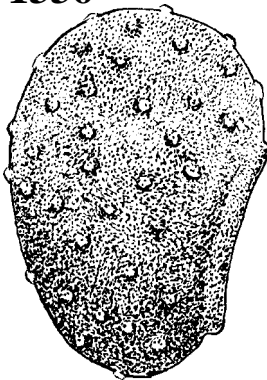


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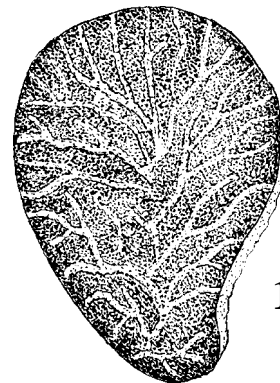


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**Surface undulate ribbed or smooth, slight lustrous, brown.  $2n = 28$ .** Native to Europe, in light deciduous forests, their clearings and margins, shrubberies. Pl, Sk.

**1339. *Potentilla supina* L.** — Annual or perennial, stems 10-40 cm long, procumbent, ascending, hirsute, sometimes glandular. **Achenes broad obovoid, flattish, dorsal side usually with an inconspicuous ridge, 0.6-0.8 x 0.5-0.7 mm. Surface dull, glabrous, rugose-ribbed, yellowish-brown.  $2n = 28$ .** Native to central, southern and eastern Europe, at pond banks, overflowed sandy places, moist ways and waste places; in the whole Carpathians.

**1340. *Potentilla tabernaemontani* Ascherson, *P. verna* auct. non L., *P. neummanniana* Reich.** — Perennial, stems decumbent, with adventive roots from nodes, flowering stems ascending, up to 30 cm high, erect. **Achenes oval, planoconvex, stigma dilative on the whole ventral side, 1.4-1.8 x 1-1.3 mm. Surface ribbed, lustreless, pale-brown.  $2n = 28$ .** Native to western Europe, in grassy areas, sunny hills; rare in the Carpathians.

**1341. *Potentilla taurica* Willd., *P. tauriciformis* Nyár.** — Perennial, stems up to 40 cm high, with 3-4, rarely 5 obovate leaves on basal part. **Achenes ellipsoid, lateral compressed, distinct suture on dorsal side, 1.5-1.8 x 1-1.2 mm. Surface of lateral sides distinct, dense veinous, slight lustrous, pale-brown.** Endemic to Romania, in arid, stony places.

**1342. *Potentilla thuringiaca* Bernh. ex Link, *P. chrysanth* auct. non Trevir: Rchb.** — Perennial, flowering stems feeble, 10-30 cm high, with 5-9 leaves. **Achenes obovoid, usually large hilum tumor on ventral side, 1.3-1.6 x 1.1-1.3 mm. Surface longitudinal ribbed, furrowed.  $2n = 42$ .** Native to Eurasia, in light oak and pine woods, shrubby slopes, loamy soils. Pl, Ro, Sk, Uk.

**1343. *Potentilla tommasiniana* F. W. Schultz, *P. trifoliata* (Borbás) Beck.** — Perennial, procumbent woody stems, flowering stems up to 10 cm high, stems and leaves with stellate hairs. **Achenes obovoid, lateral slight compressed, narrow non-transparent margin, slight clavate at the apex, conical style at the base, 1.4-1.5 x 1-1.1 mm. Surface indistinct ribbed, lustreless, pale-brown.  $2n = 28$ .** Native to central, eastern and southern Europe, on poor dry meadow, pastures, fields, light woods. Br, Hu, Pl, Ro, Sk.

**1344. *Acaena glauca* hort.** — Garden varieties of unknown origin, up to 10-15 cm high. **Fruits achenes, obconical, apex truncate with a rest of the carpel and 4 long spines, bottom gradually narrowed, 3.7-4.1 x 1.8-2.2 mm. Surface dense covered with whitish hairs, dull, dark-brown.** Plant of this species create low, dense, flat carpets, used in gardening as a compensation for grassy lawns.

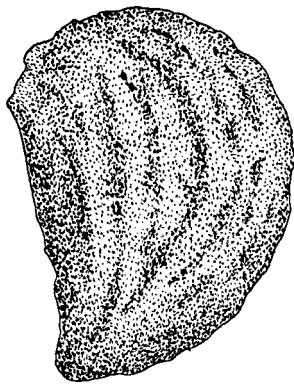
**1345. *Acaena microphylla* Hook** — Plant up to 5-6 cm high, tufty with luxuriant growth. **Fruits achenes, obtriangular or obovoid, apex truncate, with four 5-7 mm long spines (one on each edge), beak with a whitish carpel scar, 2.6-3 x 1.9-2.1 mm. Surface covered with whitish hairs, dull, reddish-brown.** Origin to South America; in the Carpathians rarely used in gardening as compensation for grassy lawns.

**1346. *Sibbaldia procumbens* L., *Potentilla sibbaldiana* Lehm.** — Perennial, stems tufted, 2-5 cm long, axillary growing from armpit of leaves. **Achenes ovoid, flattish, ventral side with two scars, apex slight curved, base obtuse, 1.1-1.4 x 0.8-1.1 mm. Surface glossy, glabrous, indistinct rugose-ribbed, light-brown.  $2n = 14$ .** Native to the north and the mountains of central and southern Europe, on rock and stony slopes in damp alpine areas. Pl, Sk.

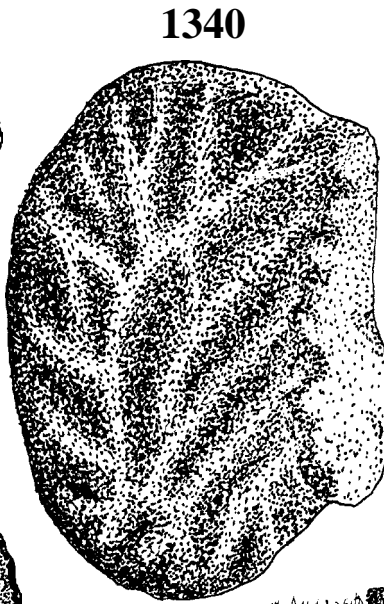
**1347. *Fragaria chiloensis* (L.) Mill., *F. vesca* var. *chiloensis* L.** — Perennial, leaves on lower side silky-shaggily, with very ascending veins, flowers and fruits larger (up to 3 cm in diam.). **Achenes  $\pm$  obovoid, concave on one lateral side, dorsal side convex, ventral  $\pm$  truncate, apex narrowed, hilum on the bottom part, 1.5-1.7 x 1.2-1.4 mm. Surface glabrous, slight lustrous, reddish-brown or scarlet.  $2n = 56$ .** Native to America, cultivated in many cvs [hybrids with *F. virginiana* and other species under the name *F. ananassa* (Duchesne) Duchesne].

**1348. *Fragaria moschata* (Duchesne) Weston, *F. elatior* Ehrh.** — Perennial, stolons few or absent, peduncles up to 40 cm high, hirsute. **Achenes in outline broad ovate, apex curved, base obtuse, 1.1-1.3 x 0.9-1.1 mm. Surface lustrous, glabrous, indistinct veinous, veins starting at attachment-scar, yellowish, brown or bright-red.  $2n = 42$ .** Native to central Europe, in moister forests and their margins, shrubberies, pastures on calcareous soils, in the whole Carpathians.

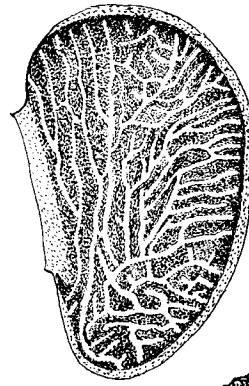
**1349. *Fragaria vesca* L.** — Perennial, plants usually with runners, peduncle, increased from rhizome,



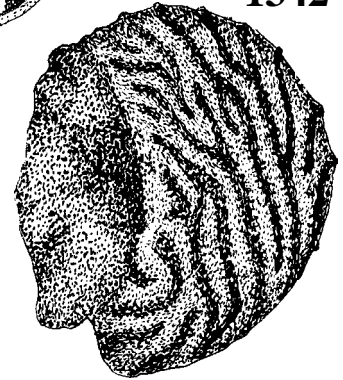
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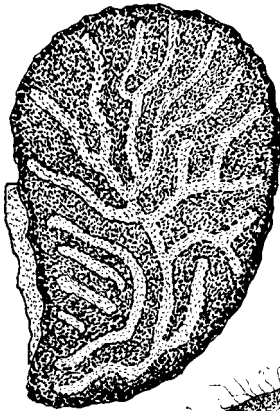
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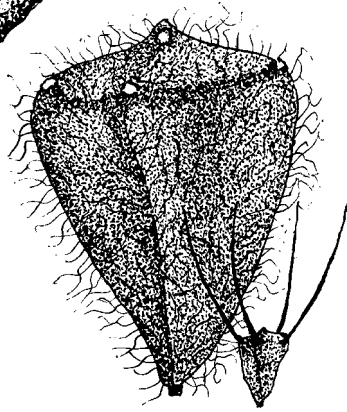
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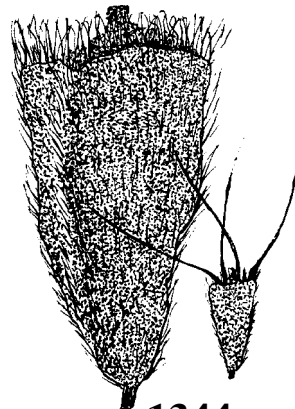
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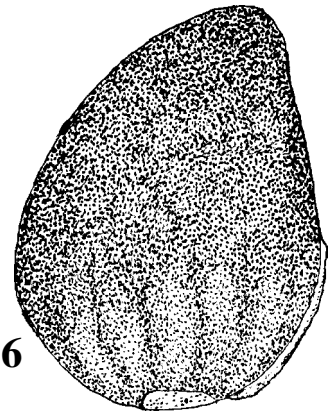
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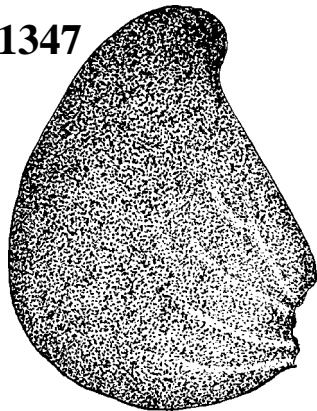
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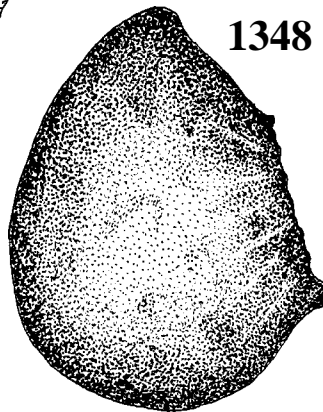
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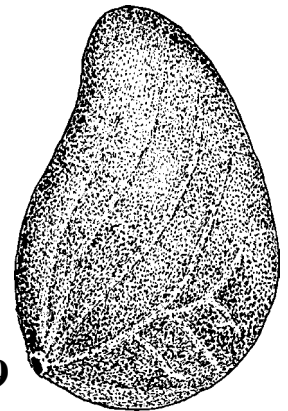
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is 5-30 cm high, hirsute. **Achenes ovoid, slight compressed, apex rounded, base obtuse, 1.2-1.4 x 0.8-1 mm. Surface glabrous, glittery, distinct veinous, veins starting at attachment-scar, light-, orange-bright red up to scarlet. 2n = 14.** Native throughout the Carpathians, in light woodlands, forest margins, shrubby slopes, clearings on a rather moist soil.

**1350. *Fragaria virginiana*** Duchesne — Perennial, rhizome non-ramified with plentiful shoots, peduncle up to 30 cm, hirsute. **Achenes ovoid, slight flattish, two scars on ventral side, apex rounded, base obtuse, 1.2-1.4 x 0.7-0.9 mm. Surface glabrous, sometimes ± distinctly veinous, light-, reddish- and blackish-brown. 2n = 56.** Originally spread from North America; in the whole Carpathians cultivated in gardens as fruit-bearing plant, mostly in hybrid forms, uniquely naturalized.

**1351. *Fragaria viridis*** (Duchesne) Weston, *F. collina* Ehrh. — Perennial, flowering stem with 3-10 flowers, erect, peduncle 5-20 cm high, hirsute. **Achenes ovoid, lateral flattish, apex rounded, 1.4-1.6 x 1-1.2 mm. Surface slight lustrous, glabrous, distinct veinous or smooth, reddish- to dark-brown. 2n = 14.** Native to the most part of Europe, except the extreme north, in dry thickets, light woodlands, semidry turfs, verges on porous, calcareous soils; throughout the Carpathians.

**1352. *Duchesnea indica*** (Andrews) Focke, *Fragaria indica* Andrews — Perennial, stems up to 50 cm, flowers single, yellow. **Achenes elliptic, semi-rounded, lateral flattish, 1.1-1.4 x 0.8-1 mm. Surface slight lustrous, undulate or smooth, scarlet. 2n = 84.** Probably native to southeastern Asia; in the Carpathians seldom cultivated in gardens as an ornamental, uniquely naturalized.

**1353. *Waldsteinia geoides*** Willd. — Perennial, rhizome creeping, stem 10-25 cm high, with 5-7 flowers in armpit of leaves. **Achenes broad obovoid, apex with a hilum, bottom narrowed into two auricles, 3.5-3.7 x 2.6-2.8 mm. Surface lustreless, fine hirsute and dark-brown in bottom part, smooth, silky hirsute and yellowish-green in upper part. 2n = 14.** Native to southeastern Europe, in light forests, shrubby slopes, in moist ground of upland and montane zones, cultivated in gardens and rock-gardens. Hu, Pl, Ro, Sk, Uk.

**1354. *Waldsteinia ternata*** (Stephan) Fritsch, *Dalibarda ternata* Stephan — Perennial, stems 10-15 cm high with 3-7 flowers, erect or ascending, hirsute. **Achenes ellipsoid, apex and bottom narrowed, 2.8-3.2 x 1-1.2 mm. Surface dense hirsute, lustreless, dirty-yellowish. 2n = 28.** Native to Euro-Siberia, on humous woods of the montane zone. Ro, Sk.

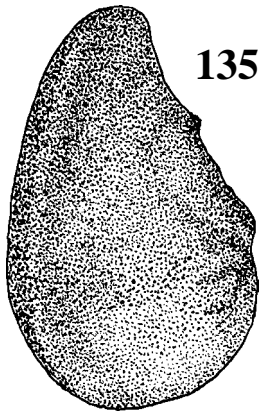
**1355. *Dryas octopetala*** L. — Perennial, procumbent shrub, dense ramified, up to 50 cm high. **Fruits achenes, narrow ellipsoid, lateral flattish, apex with conspicuous beak, up to 30 mm long, 3.5-4.4 x 0.8-1 mm. Surface dull, smooth, hairy, grey nut-brown. 2n = 18, 36.** Native to Eurasia, in mountain and high mountain elevations, especially on neutral and basic soils, rocks and screes. Pl, Ro, Sk, Uk.

**1356. *Geum allepicum*** Jacq., *G. strictum* Aiton — Perennial, stems 80-120 cm, much ramified, hirsute. **Fruits achenes, narrow obovate, long terminal recurved beak, 4-5 x 1.4-1.8 mm. Surface dull, seed-bearing part moderate hairy, rostrum base with long hairs. 2n = 42.** Native to the temperate zone of Eurasia, in shrubberies, forest margins, gardens, road borders. Hu, Mo, Pl, Ro, Sk, Uk.

**1357. *Geum chiloense*** Bak. — Perennial, similar to *G. coccineum*. **Fruits achenes, obovate, rostrum as long as achene, long recurved beak, 4.2-4.8 x 2.1-2.3 mm. Surface dull, glabrous, covered with long eglandular hairs, brown with a reddish hem.** Native to South America; in the Carpathians cultivated in gardens as a persistent ornamental plant.

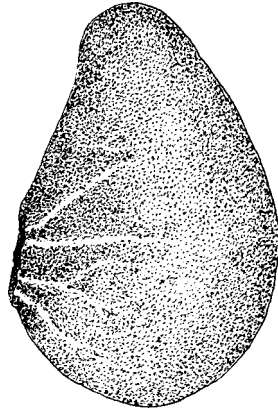
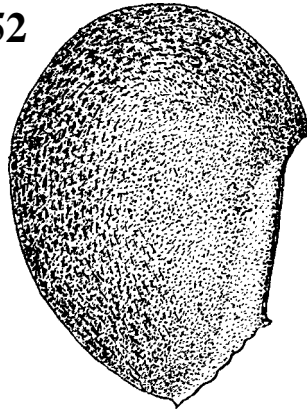
**1358. *Geum coccineum*** Sibth. et. Sm., *G. grandiflorum* C. Koch — Perennial, stems erect, branched, with small, lobed leaves. **Fruits achenes, narrowly ellipsoid, apex with long recurved conspicuous beak, 5-8 mm long, sometimes glandular, 4.2-4.6 x 1.5-1.7 mm. Surface dull, glabrous, hairy, nut-brown. 2n = 42.** Native to the Balkan region and Asia Minor; in the Carpathians often cultivated in gardens as an ornamental.

**1359. *Geum macrophyllum*** Willd., *G. japonicum* auct. non Thunb. — Perennial, up to 1 m high, erect hairy. **Fruits achenes, narrow obovate, with glandular 4-9 mm long beak, 3.2-3.8 x 1.2-1.4 mm. Surface of seed-bearing part covered with glandulas and glandular hairs, beak with glandulas. 2n = 42.** Native to North America; in the Carpathians

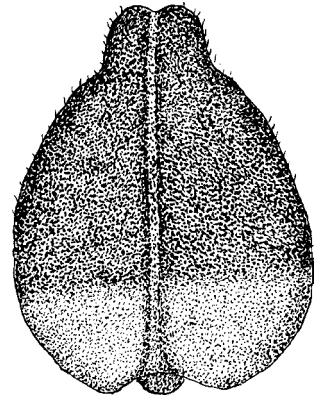


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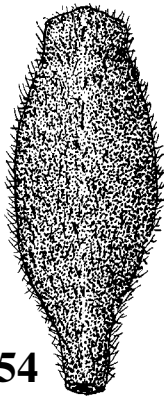
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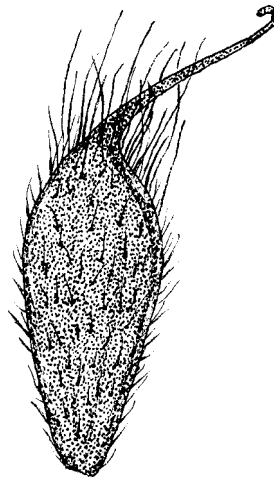
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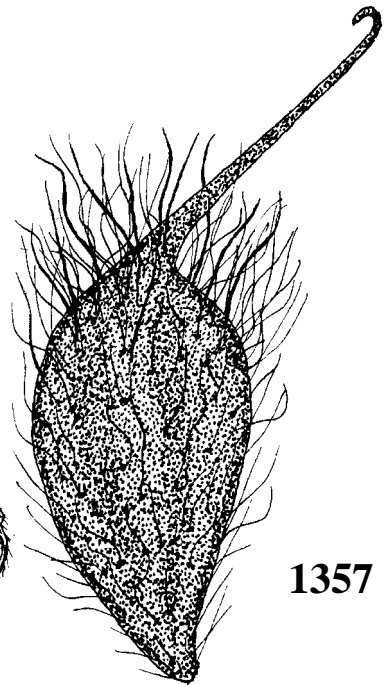
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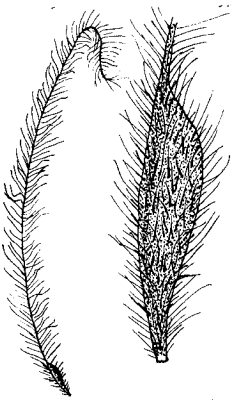
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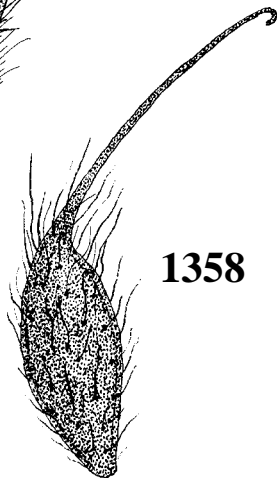
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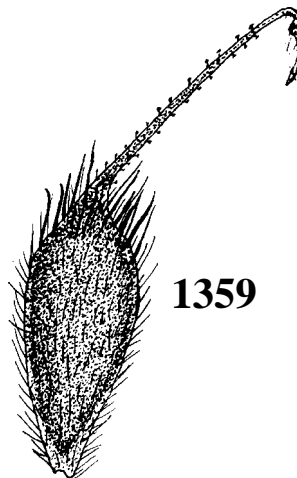
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sometimes cultivated in gardens as an ornamental, uniquely naturalized.

**1360. *Geum rivale* L.** — Perennial, stems multiflowered, drooping, 20-30 cm high, ramified. **Fruits achenes, narrow obovate or elliptic, terminal beak long 4-9 mm, 3-4 x 0.9-1.2 mm. Surface dull with long eglandulas and short glandular hairs, beak also hairy. 2n = 42.** Native in Eurasia and North-American continent, on moist and wet meadows, montane wet forests, springheads, riverbanks; in the all Carpathians.

**1361. *Geum urbanum* L., *G. rivale* subsp. *urbanum* (L.) Á. et D. Löve** — Perennial, stems 20-60 cm high, ramified, erect, hirsute. **Fruits achenes, narrow obovate to elliptic, flattish, terminal 4-7.5 mm long hairsless beak, 3.5-4.2 x 1-1.2 mm. Surface hairs stiff, eglandular, up to 1.5-2 mm long, dull, reddish brown. 2n = 42.** Native in Eurasia in mixed and deciduous woodland, wood edges, waste lands, thickets on moist nitrogenous soils, most of the Carpathians.

**1362. *Oreogeum montanum* (L.) Golubkova, *Geum montanum* L., *Sieversia montana* (L.) R. Br.** — Perennial, stems 3-30 cm high, simple, with 1-3 flowers. **Fruits achenes, narrowed obovoid, beak 1.5-2.5 cm long, hairy, 3.7-4.3 x 1.1-1.3 mm. Surface dull, tuberculate, dense hairy, yellowish-brown. 2n = 28.** Native in the Alps and Carpathians, on mountain meadows, pastures, on stony and loamy soils, acid up to neutral soils. Pl, Ro, Sk, Uk.

**1363. *Novosieversia reptans* (L.) Golubkova, *Geum reptans* L., *Sieversia reptans* (L.) R. Br.** — Perennial, flowering stems 3-15 cm high with one flower. **Fruits achenes, prolonged obovoid to elliptic, flattish, apex with conspicuous up to 2.5 cm long dense hairy beak, 2.8-3.2 x 0.9-1.1 mm. Surface dull, longitudinal tuberculate, dense hairy, yellowish-brown to brown. 2n = 42.** Native in the high mountains of Europe, on screes and rock slits. Pl, Ro, Sk.

**1364. *Aremonia agrimonoides* (L.) DC., *Agrimonia agrimonoides* L.** — Perennial, stems 5-30 cm high, hirsute. **Fruits achenes, globose, at the apex with three or four wings ended with whitish caruncle (lure for ants), 5-6 x 2.4-3.2 mm. Surface dense hirsute, glabrous, brownish. 2n = 42.** Native to the mountains of southern and central Europe, in light forests and their margins, clearings, meadows and pastures in the neighboring forests. Hu, Ro, Sk, Uk.

**1365. *Agrimonia eupatoria* L., *A. officinarum* Mill.** — Perennial, stems 15-150 cm high, scattered glandular. **Fruits achenes, 1-2 seeded, campanulate, upper part (disc) scarce projecting, 6-7 x 3.6-4.5 mm. Surface bare or with short hairs (up to 1 mm long), grooves shallow, up to 0.5 mm wide, brown, bristles 1.5-2.5 mm long, erect. 2n = 28.** Native to Europe and southwestern Asia, on damp meadows, pastures, at streams, shrubs, in all Carpathian territories; cultivated as a medicinal plant.

**1366. *Agrimonia pilosa* Ledeb., *A. dahurica* Willd. ex Ser.** — Perennial, stems 50-150 cm high, with long eglandular hairs. **Fruits achenes, obconical, disc scarce projecting, basal part grooved, grooves shallow, up to 0.5 mm wide, bristles 1-2.5 mm long, inner and outer converting to disc, 5.5-6.5 x 3-4 mm. Surface ± hairy. 2n = 28.** Native to eastern Europe and Asia, in light forest, shrubberies, open places. Br, Mo, Ro, Sk, Uk.

**1367. *Agrimonia procera* Wallr., *A. odorata* auct. non Mill.** — Perennial, stems 50-120 cm, without ground rosette, with glandular and eglandular hairs. **Fruits achenes, cupuliformis, upper surface strong projecting, bristles 2-5 mm long, inner bristles erect, outer deflexed, 6.5-7.5 x 5.5-6.5 mm. Surface hairy, basal part indistinct shallow grooved. 2n = 56.** Native to western, central and southern Europe, extending to the Ukraine, in shady, moist forests, its margins and clearings; in all Carpathian territories.

**1368. *Agrimonia repens* L., *A. odorata* Mill.** — Perennial, up to 20-100 cm high, villous, stems erect, ramified. **Fruits achenes, cupuliformis, narrowed on both ends, lower part adpressed hairy, central part with a wreath of many hooked bristles, upper part smooth, narrowed into broader beak created from sepals, 8-10 x 6-8 mm. Surface lustreless, the bottom part greyish-brown, bristles and upper part yellowish-brown. 2n = 28.** Originally growing in Asia Minor and western Asia; in the Carpathians previously cultivated in gardens, now naturalized in some places.

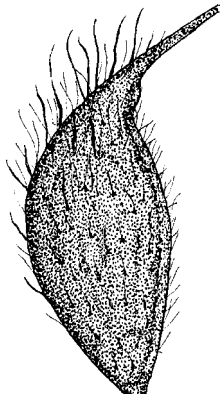
**1369. *Sanguisorba minor* Scop., *Poterium sanguisorba* L.** — Perennial, 10-90 cm high, glabrous or hairy, stems erect, leafy, ramified. **Fruits receptaculum with achenes, sclerous, dry with two achenes, ovoid, four-angled, winged on ribs, wing-shaped angles undulate, 3.5-5 x 2.3-3.2 mm. Surface between angles coarse rugose, dull, greyish-brown. 2n = 28.** Native to Eurasia, on dry



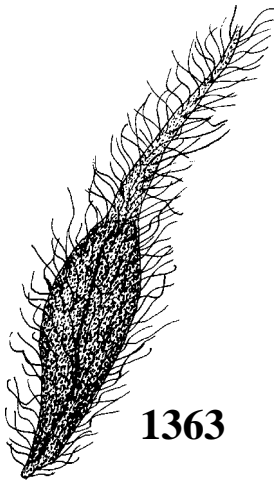
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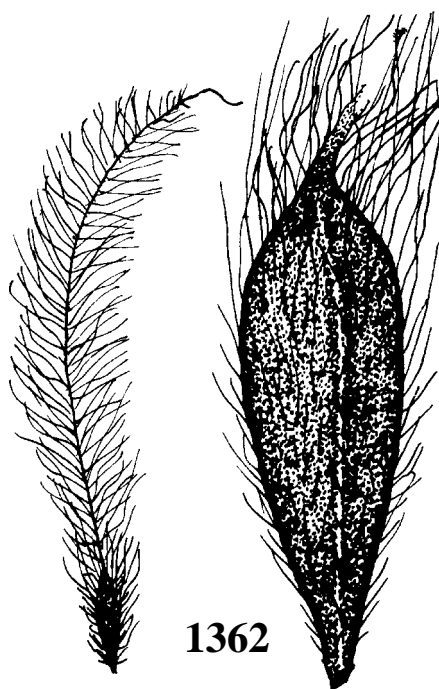
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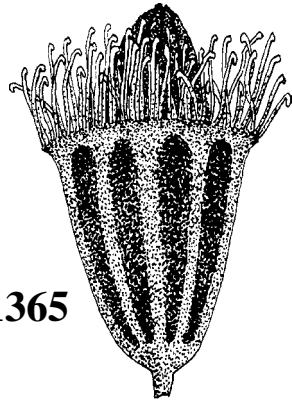
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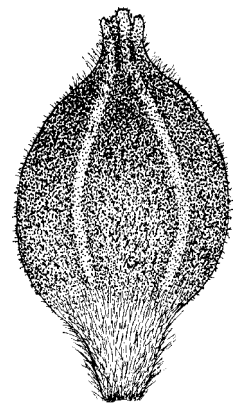
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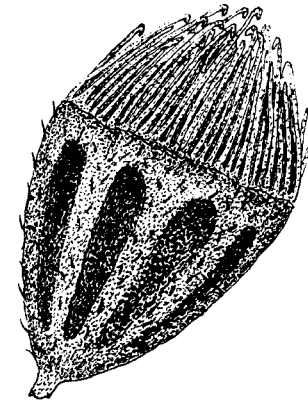
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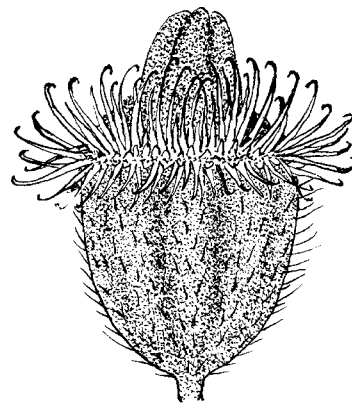
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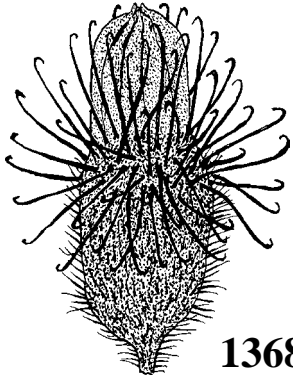
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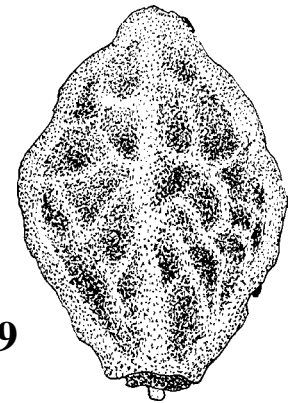
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and semidry turfs, road-side verges, in dry woods and thickets; in all Carpathian territories.

**1370. *Sanguisorba muricata*** Greml., *Poterium sanguisorba* L. subsp. *polygamum* (Waldst. et Kit.) Simonkai – Perennial, stems 15-80 cm high, erect or shortly ascending, branched, striate, bare. **Fruits receptaculum with achenes, sclerous, dry, hypanthium 4-winged, mostly undulated, irregular dentate, with deep sockets or short furrows between wings, 3.4-5 x 2.3-3.3 mm. Surface dull, brown, wings pale-brown. 2n = 28, 56.** Native in southern and central Europe, growing on sunny rocks and slopes, stony and dry places, mostly on basic stands. Hu, Pl, Ro, Sk, Uk.

**1371. *Sanguisorba officinalis*** L., *Poterium sanguisorba* A. Gray – Perennial, bare plant, 20-100 cm high, stems erect, ramified. **Fruits receptaculum with achenes, sclerous, dry, ovate, angles winged, one style at the apex, 3.1-3.8 x 1.5-2.2 mm. Surface glabrous, side faces smooth or slight roughen, brown to reddish-brown. 2n = 28, 56.** Originally an Euro-Siberian plant, on damp meadows, fens and moorlands, peaty and loamy soils; in all Carpathian territories.

**1372. *Aphanes arvensis*** L., *Alchemilla arvensis* (L.) Scop. – Annual, hirsute, greyish-green, 5-30 cm high, stems ascendent, ramified from the base. **Fruits achenes, ovoid, lateral flattish, with margins ± edged, apex acute, straight, base obtuse, 1.3-1.6 x 0.8-1 mm. Surface usually glossy, glabrous, smooth and fine areolate, yellowish-brown. 2n = 48.** Originally growing in the Mediterranean and Euro-Siberian territories, now nearly a cosmopolite, on tilled grounds and other open habitats. Hu, Pl, Ro, Sk, Uk.

**1373. *Aphanes australis*** Rydb., *A. microcarpa* auct. non (Boiss. et Reuter) Rothm. – very similar to *A. arvensis*, but tenderer and light-green, stems 5-15 cm high, internodes longer. **Fruits achenes, ovoid, lateral compressed, apex acuminate, bottom broader, with small hilum, 0.9-1 x 0.8-0.9 mm. Surface smooth, lustrous, pale-greyish. 2n = 16.** Native to Europe, in open habitats, on sandy, usually acid soils. Hu, Pl, Ro, Sk.

**1374. *Alchemilla acutiloba*** Opiz, *A. vulgaris* L. em Froehn. – Perennial, up to 50-70 cm high, grass-green or yellowish-green. **Fruits achenes, ovoid, slight lateral flattish, apex acute, base obtuse, attach-**

**ment scar subbasal, 1.4-1.6 x 0.9-1.1 mm. Surface dull, glabrous, ventral side with a suture, light-brown. 2n = 102-109.** Euro-Siberian plant, in damp meadows, waste places, forest margins, a calcifuge; in all Carpathian territories.

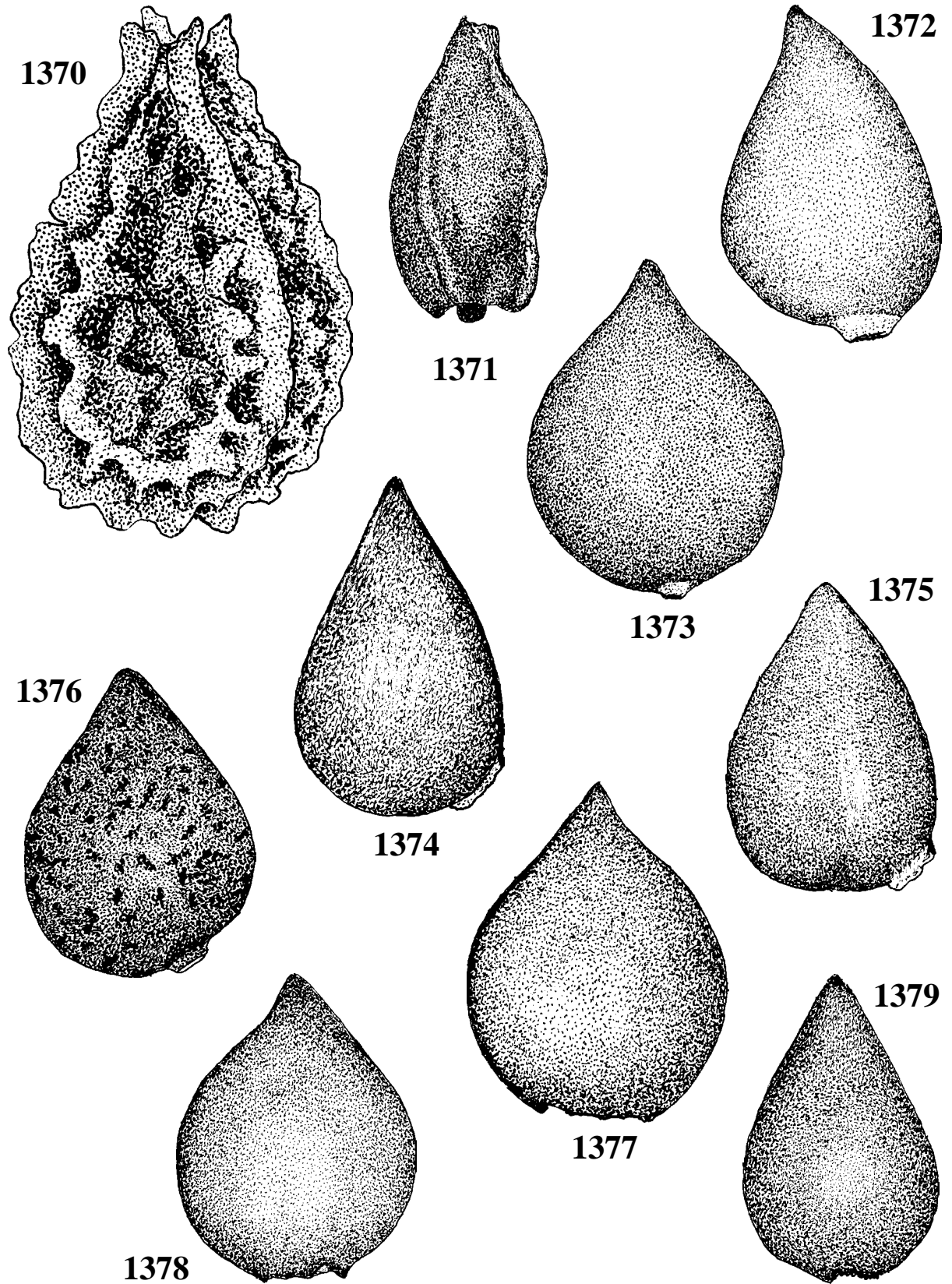
**1375. *Alchemilla conjuncta*** Bab., *A. plicatula* Gand. – Perennial, up to 35 cm high, crooked, ascendent or prostrate, hirsute. **Fruits achenes, ovoid, slight flattish, ventral side with or without suture, apex acute, base obtuse, attachment scar subbasal, 1.6-1.8 x 1-1.2 mm. Surface dull, glabrous, smooth, light-brown. 2n = 99-106.** Native to Jura and the Alps, on damp meadows, pastures, riverbanks; in the Carpathians widely cultivated in gardens and naturalized.

**1376. *Alchemilla crinita*** Buser – Perennial, stems up to 40 cm high, leaves reniform, very shallowly lobed, with a wide sinus. **Fruits achenes, broad ovoid, lateral slight compressed, apex blunt acuminate, 1.2-1.4 x 0.9-1 mm. Surface smooth, faint lustrous, pale-brown, dark-brown spotted. 2n = 102-108.** Native to Eurasia, in mountain meadows and pastures, roadsides, high mountain ridges, screes. Hu, Pl, Ro, Sk.

**1377. *Alchemilla erythropoda*** Juz., *A. erythropodoides* Pawl. – Perennial, up to 20 cm high, dense hirsute. **Fruits achenes, ovoid, slight flattish, distinct suture on ventral side, 1.4-1.7 x 1.1-1.3 mm. Surface dull, glabrous, nut-brown. 2n = 101-108.** Native to the mountains of the West Carpathians and the Balkan Peninsula, on alpine pastures, rocky slopes, montane meadows, calcareous soils. Sk.

**1378. *Alchemilla filicaulis*** Buser, *A. minor* (Hudson) Buser – Perennial, smaller plant with slender stems up to 40 cm high, 7-9 lobed leaves. **Fruits achenes, broad ovoid, slight flattish, weak distinct suture, 1.4-1.6 x 1.1-1.3 mm. Surface glabrous, smooth, light-brown. 2n = 96, 101-110, 148-155.** Native to montane and alpine zones of western and central Europe, in dry, stony, poor soils. Ro, Sk.

**1379. *Alchemilla fissa*** Günth. et Schummel, *A. glaberrima* (F. W. Schmidt) Buser non Opiz – Perennial, up to 20 cm high, stems procumbent or ascending. **Fruits achenes, ovoid, slight flattish, slight visible suture, attachment scar basal, 1.4-1.6 x 0.8-1 mm. Surface slight lustrous, glabrous, smooth, brown. 2n = 142-152.** Native to the mountains of Europe, in moist places of



scree, snow-patches, springheads, on acid and basic substrates. Pl, Ro, Sk, Uk.

**1380. *Alchemilla flabellata*** Buser, *A. taurica* Juz. — Perennial, 5-25 cm high, very tender, densely pubescent, stems erect. **Fruits achenes, ovoid, large hilum, apex gradually narrowed, 1.3-1.5 x 0.9-1.1 mm. Surface glabrous, lustreless, light-brown. 2n = 101-106.** Native to Europe, on mountain pastures, grassy slopes, high mountain planes and scree. Pl, Ro, Sk, Uk.

**1381. *Alchemilla glabra*** Neygenf., *A. alpestris* (E. W. Schmidt) Opiz — Perennial, up to 60 cm high, leaves glabrous, undulate. **Fruits achenes, ovoid, slight flattish, ventral side with a suture, apex acute, attachment scar subbasal, 1.4-1.6 x 1-1.2 mm. Surface slight lustrous, glabrous, fine areolate, brown. 2n = c. 96, 100, 102-110.** Native to northern and central Europe, on wet soils, river-heads and banks, wet meadows and pastures, common in the montane zone. Hu, Pl, Ro, Sk, Uk.

**1382. *Alchemilla glaucescens*** Wallr., *A. pubescens* auct. non Lam. — Perennial, up to 30 cm high, dense patent hirsute. **Fruits achenes, broad ovoid, slight flattish, apex acute, basal attachment scars, 1.3-1.5 x 0.9-1.1 mm. Surface slight lustrous, glabrous, light-brown to brown. 2n = 102, 108.** Native to central and northeastern Europe, on grassy and stony slopes, semidry meadows; in all Carpathian territories.

**1383. *Alchemilla gorcensis*** Pawl. — Perennial, up to 60 cm high, robust. **Fruits achenes, ovoid, slight flattish, apex acute to curved, base obtuse, attachment scar subbasal, 1.3-1.5 x 0.8-1 mm. Surface glabrous, dull, brown.** Endemic to the West Carpathians, in wet places, brooks banks, high-mountain meadows. Pl, Sk, Uk.

**1384. *Alchemilla incisa*** Buser, *A. firma* auct. non Buser — Perennial, 5-20 cm high, tender, stems erect, leafy only in the lower part, leaves on vein silkily pubescent. **Fruits achenes, broad ovoid, apex gradually narrowed, blunt acuminate, 1.3-1.5 x 1-1.2 mm. Surface glabrous, faint lustrous, pale-brown. 2n = 103-108.** Native to high mountains of Europe, in dwarf pine clearings, snow-lying, spring-heads, stony slopes. Pl, Ro, Sk, Uk.

**1385. *Alchemilla micans*** Buser, *A. gracilis*, *A. opizii* Hadač — Perennial, up to 50 cm high, usually rather slender, leaves more or less reniform, subsericeous.

**Fruits achenes, ovoid, lateral slight compressed, upper part narrowed, 1.4-1.6 x 0.9-1.1 mm. Surface glabrous, slight lustrous, pale-brown. 2n = 104-110.** Native to Euro-Siberia, on lawns in parks, boundaries, grassy margins of forest roads, meadows, pastures throughout the Carpathians.

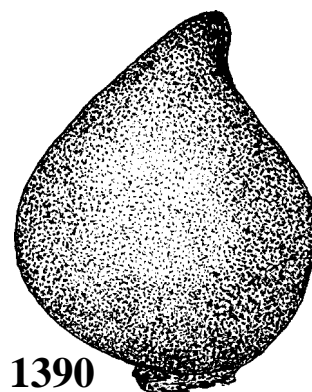
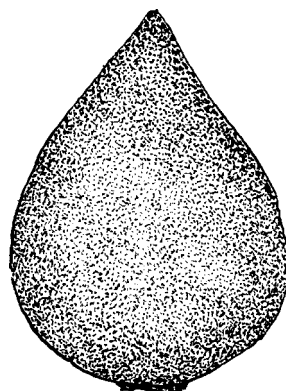
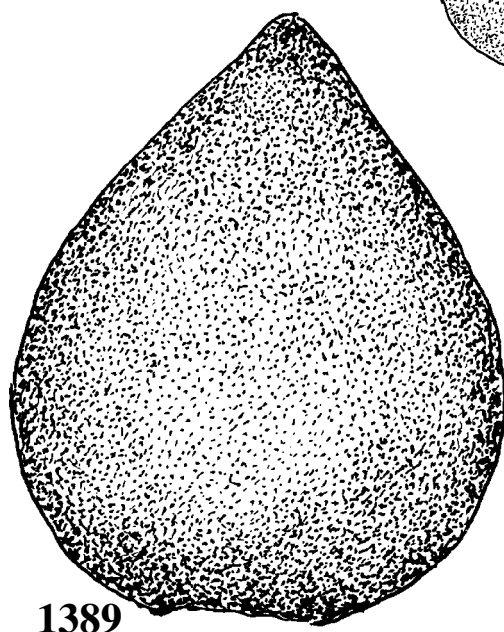
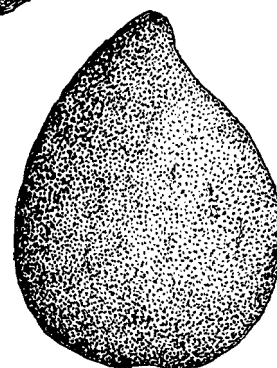
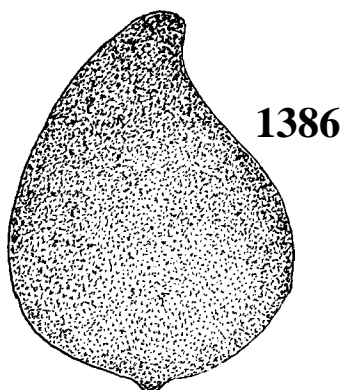
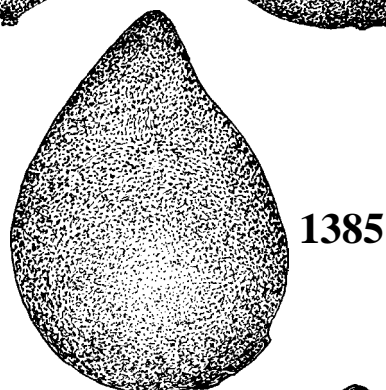
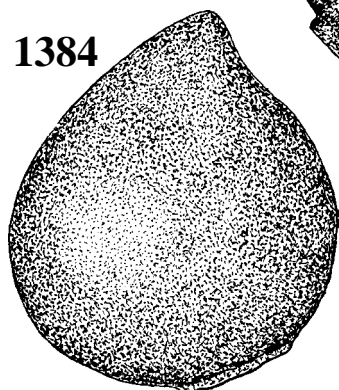
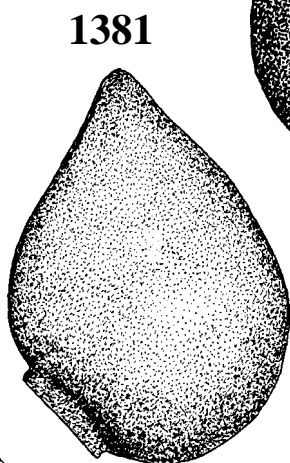
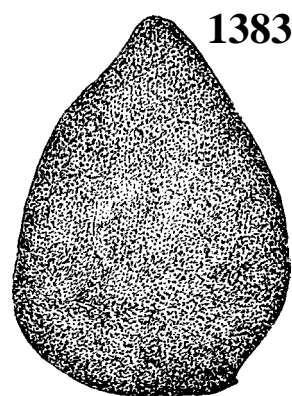
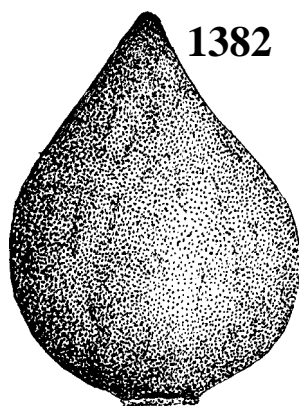
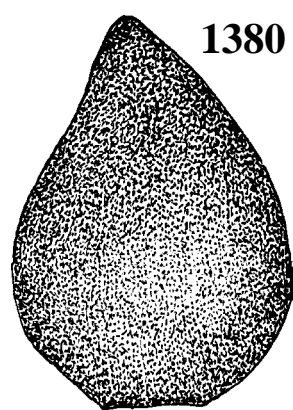
**1386. *Alchemilla mollis*** (Buser) Rothm., *A. acutiloba* Stev. Non. Opiz — Perennial, robust, 20-80 cm high, densely hirsute. **Fruits achenes, broad ovoid, slight flattish, apex acute and curved, small attachment scar basal, suture distinct, 1.2-1.4 x 0.8-1 mm. Surface glabrous, fine areolate, light-brown to brown. 2n = 102-106.** Native to eastern Carpathians, in subalpine and alpine zones, on stony calcareous slopes. Ro, Sk.

**1387. *Alchemilla monticola*** Opiz, *A. vulgaris* L. sec. Buser — Perennial, up to 50 cm high, erect, ascendent to procumbent, leaves on both sides hirsute. **Fruits achenes, ovoid, ventral surface with suture, apex acute to slight curved, attachment scar basal, 1.1-1.3 x 0.7-0.9 mm. Surface smooth or fine areolate, brown. 2n = 101-110.** Native to Euro-Siberia, lawns in orchards and parks, boundaries, rocky igneous slopes, forest margins, meadows and pastures; in all Carpathian territories.

**1388. *Alchemilla plicata*** Buser, *A. hungarica* Soó — Perennial, a low-growing plant, leaves reniform, undulate. **Fruits achenes, ovoid, lateral slight compressed, apex acuminate, bottom rounded with a larger hilum, 1.5-1.7 x 1-1.1 mm. Surface faint waved, slight lustrous, brown. 2n = 104-108.** Native to Europe, on semidry, mossy margins of forests, *Nardus stricta* meadows, grassy ridges, in alpine and subalpine zones, most of the Carpathian regions.

**1389. *Alchemilla speciosa*** Buser — Perennial, robust, up to 50-100 cm high, usually with dense patent hairs. **Fruits achenes, broad ovoid, slight compressed, with pale indistinct lateral ribs, apex narrowed, slight acuminate, base obtuse, 1.3-1.5 x 0.9-1.1 mm. Surface faint lustrous, glabrous, yellowish-brown to brown. 2n = 102-116.** Originally growing in the Caucasus; in the Carpathians rarely cultivated as an ornamental and naturalized.

**1390. *Alchemilla xanthochlora*** Rothm., *A. vulgaris* L. — Perennial, up to 50 cm high, robust, often yellowish-green. **Fruits achenes, broad ovoid, apex acute, slight curved, base obtuse, 1.2-1.4 x 0.9-1.1 mm. Surface fine areolate, slight lustrous,**



**light- to dark-brown.  $2n = c. 105$ .** Native to western and central Europe, on moister meadows, shrubberies, moist screes, ditches; in all Carpathian territories.

**1391. *Laurocerasus officinalis* M. Roem., *Prunus laurocerasus* L.** — Shrub, evergreen, 2-6 m high. **Stones broad ovoid, with a suture all around, apex acute, 7-10 x 5-6.5 mm. Surface smooth, yellowish-brown.  $2n = 144, 170-180$ .** Originally growing in the eastern Mediterranean; extensively planted in parks of warmer areas of the Carpathians, an attractive woody species with interesting leaves, flowers and fruits.

**1392. *Padus avium* Mill., *Padus racemosa* (Lam.) C. K. Schneid., *Prunus padus* L.** — Tree or shrub, up to 15 m high, bark shiny reddish-brown. **Stones spherical to broad ovoid, blunt-pointed at the apex, with suture broaden on ventral and narrowed on dorsal side, 6.4-7 x 4.5-5 mm. Surface reticulate strong ridged, rough, light-brown.  $2n = 32$ .** Native to the western part of Euro-Siberia; in the Carpathians plentiful in lowland and upland zones, in damp forests, often planted in parks.

**1393. *Padus serotina* (Ehrh.) Borkh., *Prunus serotina* Ehrh.** — Tree, up to 20 m high, bark aromatic. **Stones spherical with suture around, apex rounded with a small tip, base tapered into hilum, 8-10 x 6-8 mm. Surface smooth, yellowish-brown.  $2n = 32$ .** Originally spread from North America, extensively cultivated in parks, sometimes also in forests for timber mass, occasionally naturalized; in all Carpathian territories.

**1394. *Padus virginiana* (L.) Mill., *Prunus virginiana* L.** — Tree or shrub, up to 15 m high, trunk up to 1.2 m in diam. **Stones  $\pm$  oval, lateral slight compressed, apex and bottom narrowed, 6.6-7 x 4.3-4.8 mm. Surface with some depressions, elevations, furrows and ribs, dull, violet-brown.** Originally growing in North America, introduced into Europe and planted in parks, gardens as an attractive ornamental tree; in warmer areas of the Carpathians.

**1395. *Cerasus avium* (L.) Moench, *Prunus avium* (L.) L.** — Tree, up to 30 m high. **Stones subglobose with suture around, slight compressed in upper part, 8-12 x 7-8 mm. Surface smooth, yellowish- or whitish-brown.  $2n = 16$ .** Originally native to Eurasia and northern Africa; in deciduous forests and shrubbery slopes, widely cultivated in many cultivars as a favorite fruit; in the whole Carpathians.

**1396. *Cerasus fruticosa* Pall., *Prunus fruticosa* Pall.** — Shrub, up to 50-150 cm high, procumbent, glabrous. **Stones globular or ovoid, narrowed at both ends, with a strong suture on ventral side, and a thin one on dorsal side, 6-8 x 5-6 mm. Surface smooth, light-yellowish.  $2n = 32$ .** Native to south-eastern Europe and western Asia, in thickets, rocky slopes, forest margins, boundaries, seldom cultivated for fruits; in all Carpathian territories.

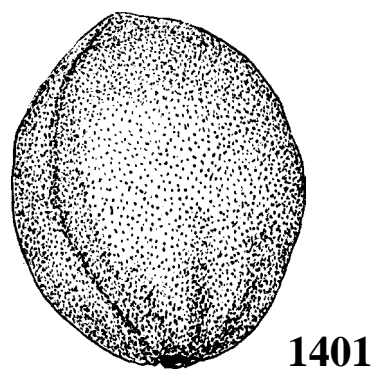
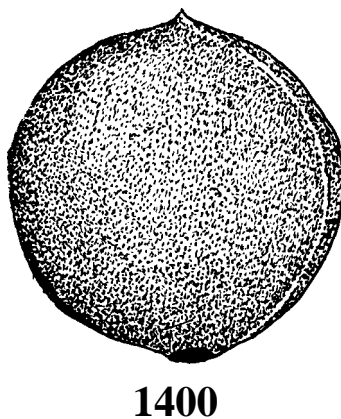
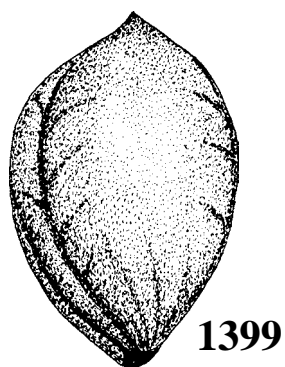
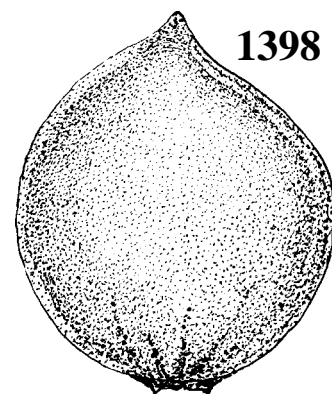
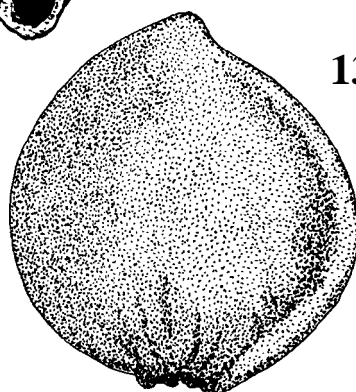
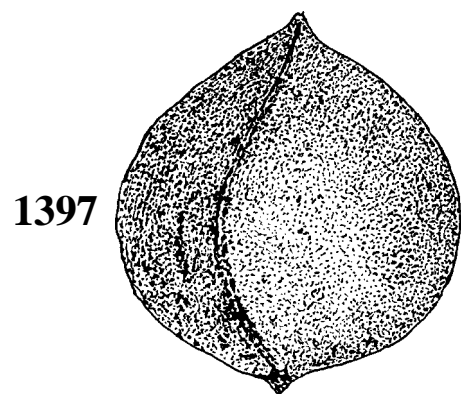
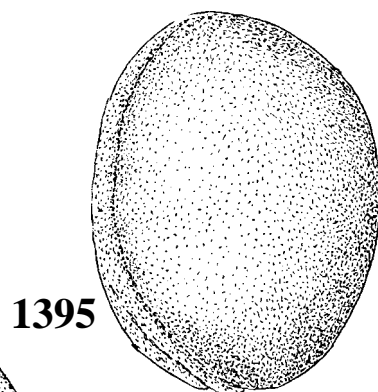
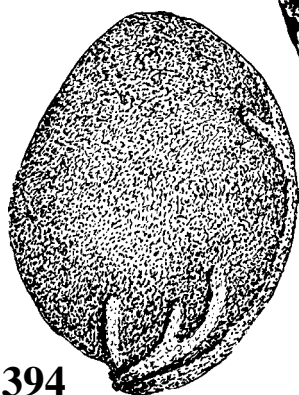
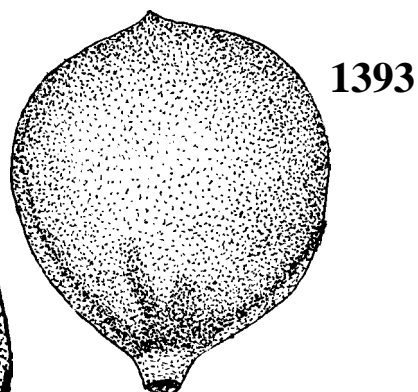
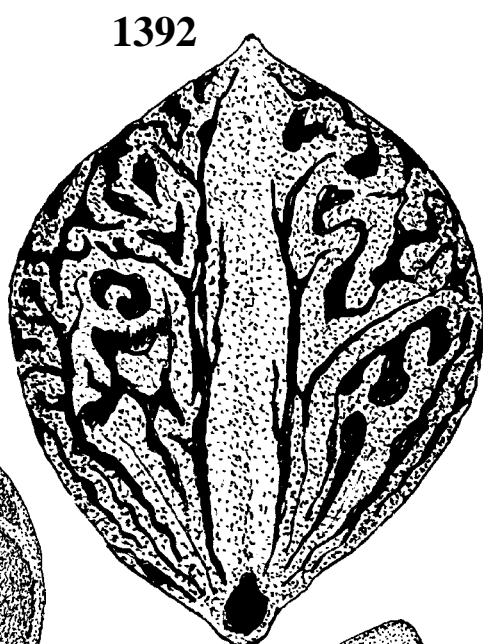
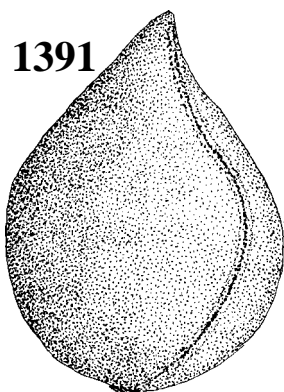
**1397. *Cerasus japonica* (Thunb.) Loisel, *Microcerasus japonica* M. Roem., *Prunus japonica* Thunb.** — Shrub, up to 1 m high, young shoots glabrous, flowers pinkish or white. **Stones  $\pm$  spherical, faint lateral compressed, with suture or furrow all the stone around, apex acute, bottom with rounded hilum, 8.5-9 x 6.8-7.2 mm. Surface furrowed and pitted, coarse, lustreless, pinkish or violet-brown.** Native to Japan and China; cultivated in gardens and parks as an ornamental. Ro.

**1398. *Cerasus mahaleb* (L.) Mill., *Prunus mahaleb* L.** — Shrub or tree, up to 10 m high, young twigs glandular-puberulent. **Stones globular or ovoid with suture around, apex acuminate, 5.5-6.5 x 4.4-5 mm. Surface smooth, whitish-grey.  $2n = 16$ .** Native to southern Europe and southwestern Asia, mostly in uplands on calcic and dolomite grounds; exploited as an understock in fruit culture in the whole Carpathians.

**1399. *Cerasus pumila* (L.) Michx., *Prunus pumila* L.** — Tree, up to 2 m high, erect or procumbent. **Stones obovoid or elliptic, three furrows and lateral furrowlets, apex narrowed into point, with a suture, 9-10.6 x 6.5-7 mm. Surface smooth, violet-grey.** Originally spread from North America; in the Carpathians cultivated in parks and orchards as ornamental.

**1400. *Cerasus serrulata* (Lindl.) G. Don, *Prunus serrulata* Lindl.** — Tree, up to 15 m high, bark smooth, rich inflorescence pink. **Stones globose to spheroidal, suture on ventral side broad, on dorsal narrow, pointed at the apex, 6-8 x 6-8 mm. Surface smooth, yellowish-brown.  $2n = 16, 24$ .** Originally spread from eastern Asia; in the Carpathians cultivated in town verdure, in several cvs, known under the name Sakura.

**1401. *Cerasus vulgaris* Mill., *Prunus cerasus* L.** — Tree or shrub, about 8 m high. **Stones globular or elliptic, slight flattish, apex slight acuminate, with**



suture around, 8-10 x 7.5-8.5 mm. Surface smooth, yellowish.  $2n = 32$ . Originally growing in western Asia, among shrubberies and in forests; now extensively cultivated in several cvs, for its sour fruits, widely naturalized.

**1402. *Prunus americana* Marsh.** — Tree, up to 10 m high, young shoots reddish, often spined, leaves oblong-obovate or elliptical, with dentated margins, 5-10 x 2-4 cm, fruit spherical, c. 2 cm in diam. **Stones ellipsoid, lateral slight compressed, dorsal side with a furrow, ventral side with a ridge, apex slight acuminate, bottom truncate, 1.2-2 x 1-1.3 mm. Surface smooth, dull, brown.** Native to North America; in the Carpathians rarely cultivated in gardens. Ro.

**1403. *Prunus cerasifera* subsp. *myrabolan* Ehrh., *P. divaricata* Ledeb., *P. myrobalana* (L.) Loisel.** — Shrub or tree, dense branched, sometimes twigs change to thorns. **Stones ovoid or ellipsoid, lateral flattish, pointed at the apex, base truncate, 15-20 x 10-15 mm. Surface slight roughish to smooth, reddish-brown.  $2n = 16$ .** Native to southwestern Asia; in the Carpathians cultivated in parks and orchards for its fruit or as a hedge, often naturalized on boundaries and in waste places.

**1404. *Prunus cerasifera* subsp. *pissartii* Carrière** — Small tree with atropurpureous leaves and rose flowers. **Stones tear-shape, lateral compressed, with two sutures on dorsal and one on ventral side, 13-16 x 9-11 mm. Surface waved, lustreless, pinkish-brown.** Native to southwestern Asia; often cultivated in gardens, town verdure and parks as an ornamental species.

**1405. *Prunus domestica* L., *P. oeconomica* Borkh.** — Tree, branches without thorns, 5-10 m high. **Stones ellipsoid to ovoid, lateral flattish, ventral side with suture, dorsal with deep groove, edges acute, apex acute, base obtuse to truncate, endocarp well separated from the mesocarp, 20-25 x 10-15 mm. Surface roughen, reddish-brown.  $2n = 48$ .** Originally growing in southwestern Asia; now in the Carpathians widely cultivated in orchards for palatable fruits, naturalized, mainly near houses.

**1406. *Prunus insititia* L., *P. domestica* subsp. *insititia* (Jusl.) C. K. Schneid.** — Shrub or tree, up to 6 m high, sometimes weakly thorny, fruit endocarp adherent to mesocarp. **Stones ellipsoid, lateral flattish, ventral side with a suture, dorsal with a**

**groove, edges acute, apex and base usually acute, 20-25 x 12-17 mm. Surface roughen, yellowish-brown.  $2n = 48$ .** Origin unknown, widely cultivated in orchards for its fruits.

**1407. *Prunus salicifolia* Kunth** — Shrub or tree, 2-4 m high, corona prostrate, bark smooth, dark reddish-brown. **Stones spherical, globular, on one lateral side with 2 or 3 on other with only 2 deep furrows, 17-23 x 17-21 mm. The rest of surface deep irregular-furrowed, faint foveolate, dull, brown.** Native to North America; in the Carpathians rarely planted in parks and gardens as an interesting and attractive species.

**1408. *Prunus spinosa* L.** — Shrub, up to 3 m high, dense branched and thorny. **Stones ellipsoid to broad ovoid or subglobose, lateral flattish, ventral side with suture, dorsal with groove, apex and base obtuse, 7-9 x 6-8 mm. Surface roughened-alveolate-reticulate, reddish-brown.  $2n = 32$ .** Native to Eurasia, common in thickets and hedges, steppes and waste places; widely spread in all Carpathian territories.

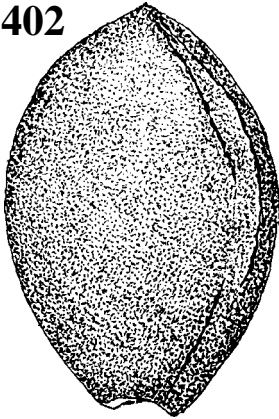
**1409. *Prunus stepposa* Kotov** — Shrub, up to 1-2 m high, leaves obovoid or elliptic, with an acute apex, 3.5-5 x 2-3 cm. **Stones  $\pm$  rounded, lateral compressed, ventral side with 2 longitudinal furrows, apex with small beak, 8-9 x 7.5-8.5 mm. Surface reticulate-foveate, dull, pale-brown.** Native to southeastern Europe, on steppes, felling areas. Uk.

**1410. *Prunus tomentosa* (Thunb.) Wall.** — Shrub, with spreading twigs, up to 3 m high, dense leafy, white or faint pink flowers. **Stones spherical, lateral slight compressed, dorsal side with narrow furrow, ventral side with a broad suture, 6-7 x 4.8-5.4 mm. Surface glabrous, dull, pale-brown dark-red.** Native to northern and western China, the Himalayas; in the Carpathians rarely cultivated in parks.

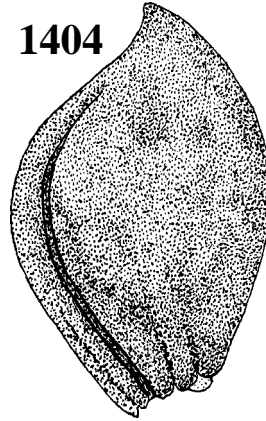
**1411. *Prunus virginiana* (L.) Roem.** — Tree, up to 15 m high, flowers 8-15 mm in diam., white, fruits spherical, c. 8 mm, dark-red. **Stones  $\pm$  spherical, dorsal side convex, with a narrow furrow, ventral side with broad suture, apex blunt acuminate, 6.5-7 x 4.3-4.7 mm. Surface  $\pm$  humpy, dull, brown.** Native to North America; in the Carpathians rarely cultivated in parks.



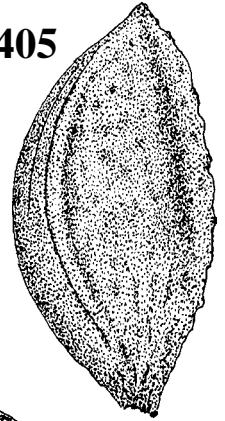
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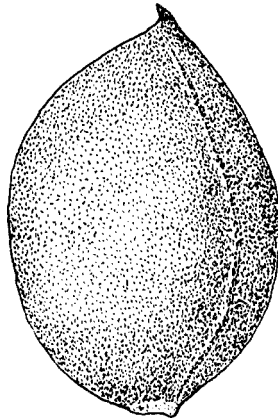
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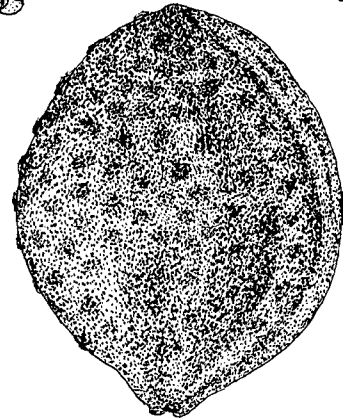
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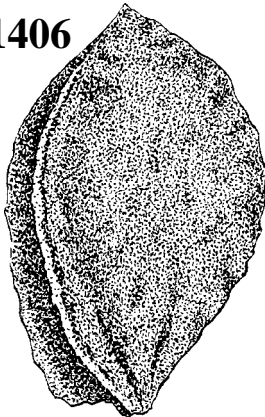
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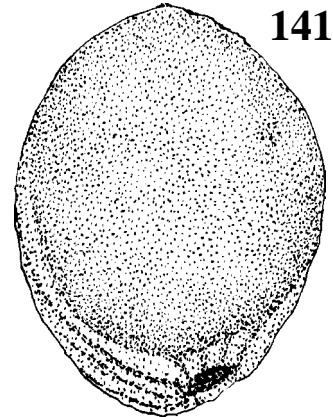
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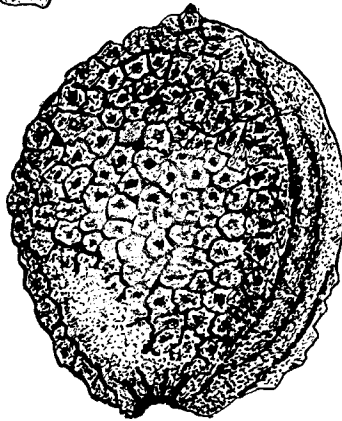
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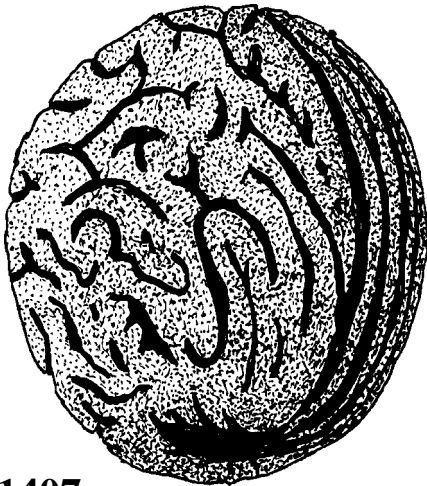
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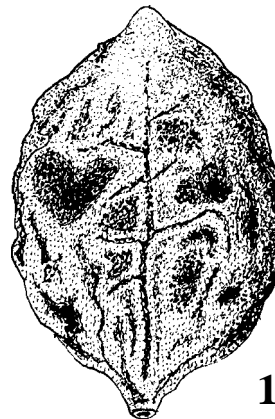
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**1412. *Persica vulgaris*** Mill. subsp. *vulgaris*, *Prunus persica* (L.) Batsch — Tree, up to 6 m high, twigs angular, glabrous, reddish. **Stones elliptic to obovoid, lateral flattish, ventral side with suture, apex apiculate, base obtuse, 30-35 x 20-25 mm. Surface deep irregular sulcate, brown to reddish-brown. 2n = 16.** Originally spread from China; now widely cultivated in many cultivars for its palatable fruits, in all warmer parks of the Carpathians.

**1413. *Armeniaca vulgaris*** Lam., *Prunus armeniaca* L. — Shrub or small tree, 3-10 m high. **Stones ellipsoid, lateral flattish, with 3 narrow ridges along one margin, apex acute, base obtuse, endocarp lenticular, smooth, 18-25 x 12-18 mm. Surface slight tuberculate, reddish-brown. 2n = 16.** Originally spread from central and eastern Asia; cultivated in orchards, gardens, fields, for its palatable fruits; in all warmer parks of the Carpathians.

**1414. *Amygdalus communis*** L., *Prunus amygdalus* (L.) Batsch, *P. dulcis* (Mill.) D. A. Webb — Shrub or tree, up to 8 m high. **Stones ovoid, lateral compressed, apiculate at the apex, rounded at the base, 3-4 x 1.5-2.2 mm. Surface pitted and grooved, cinnamon-brown. 2n = 16.** Originally growing in western Asia; in the Carpathians cultivated in the warmest areas, for its edible kernel, in orchards and gardens. Hu, Mo, Ro, Sk, Uk.

**1415. *Amygdalus nana*** L., *Prunus nana* (L.) Stokes non Du Roi, *P. tenella* Batsch — Shrub, up to 1.5 m high, branches suberect, grey, dense leafy. **Stones globular, lateral flattish, suture on ventral side, apex acute, base obtuse, 1.3-1.7 x 1.1-1.5 mm. Surface shallow furrowed, cinnamon-brown. 2n = 16.** Originally to southeastern Europe and western Asia; in the Carpathians cultivated in gardens as an ornamental. Hu, Mo, Ro, Sk, Uk.

**1416. *Cotoneaster acutifolia*** Turcz., *C. pekinensis* Zab. — Shrub, up to 4 m high, leaves mostly acuminate, 3-5 cm long, fruits black, mostly with 2 pyrenes, c. 1 cm long, elliptic. **Pyrenes obovoid, lateral compressed, dorsal side convex, ventral side rooflike, 5.4-6 x 3.5-4 mm. Surface upper part smooth, lower part rough, dull, with shallow and deep furrows, lustrous.** Native to northern China; in the Carpathians rarely cultivated in parks.

**1417. *Cotoneaster alaunicus*** Golitsin, *C. niger* subsp. *matrensis* (Domokos) Hrabětová — Shrub, 1-3 m high, twigs patent to erect, bare, leaves

ellipsoidal, 15-40 mm long. **Pyrenes obovoid, planoconvex, apex rounded, whitish, 3.8-4.3 x 3-3.4 mm. Surface punctulate, slight lustrous, brown. 2n = 51, 68.** Native to the Carpathians and central Russia, probably of hybrid origin (*C. integerimus* x *niger*). Hu, Sk.

**1418. *Cotoneaster dammeri*** C. K. Schneid., *C. humifusa* Duthie ex H. J. Veitch — Shrub, persistent, a procumbent, often rooting down shrub. **Pyrenes obovoid, apex obtuse, base acute, 4.3-4.7 x 3-3.4 mm. Surface of the apex and ventral side lustrous with longitudinal suture, bottom and dorsal side dull, with one or two furrows, brown.** Originally spread from central China; in the Carpathians seldom cultivated in parks.

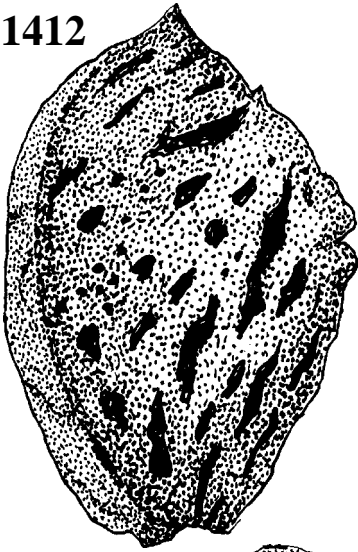
**1419. *Cotoneaster dielsianus*** Pritz. — Shrub, up to 2 m high, leaves ovoid, acuminate, 1-2.5 mm long, flowers pale-pink, in 3-7 pubescent crests, fruits red, up to 6 mm in diam. **Pyrenes obovoid, lateral compressed, dorsal side convex, ventral flat or concave, with longitudinal furrows, apex as cap, 4.8-5.6 x 3.5-3.9 mm. Surface of the dorsal side glossy, brown, apex slight lustrous, dark-brown, bottom dull, pale-brown.** Native to central and western China; in the Carpathians rarely cultivated in parks.

**1420. *Cotoneaster horizontalis*** Decne. — Shrub, partly evergreen, about 50 cm high, twigs horizontally prostrate, dense ramified. **Pyrenes ellipsoid to broad ellipsoid, apex and style obtuse, 3.5-4 x 2.5-3 mm. Surface of the apex lustrous to glossy and smooth, bottom part dull and roughened; surface of the ventral side with a longitudinal suture, orange-brown. 2n = 51, 68.** Originally growing in China; in the Carpathians often cultivated in parks and rock-gardens.

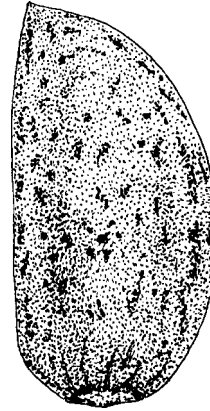
**1421. *Cotoneaster integerimus*** Medik., *C. vulgaris* Lindl. — Shrub, with erect twigs, ramified, 20-100 cm high, young twigs downy. **Pyrenes ellipsoid to obovoid, apex obtuse, base acute, 3.5-4.3 x 2.9-3.5 mm. Surface of the apex and the ventral part slight lustrous, dorsal part dull. 2n = 51, 68.** Native to the great part of Europe, on dry thickets and woodlands, mainly on steep, rocky, south-facing slopes; in the Carpathians frequently cultivated in parks. Hu, Mo, Pl, Ro, Sk, Uk.

**1422. *Cotoneaster melanocarpus*** (Bunge) Fisch et C. A. Mey, *C. niger* (Ehrh.) Fr., *C. orientalis*

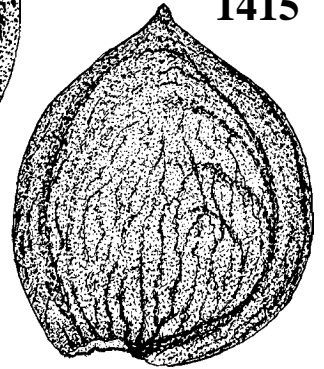
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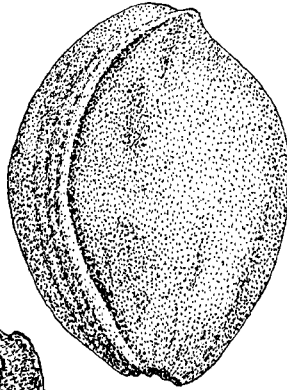
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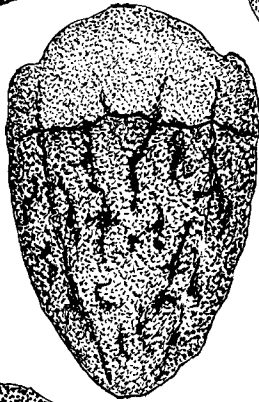
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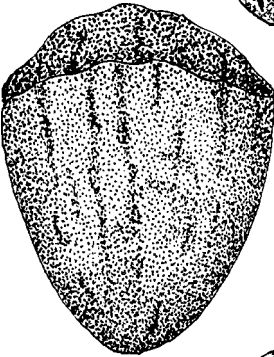
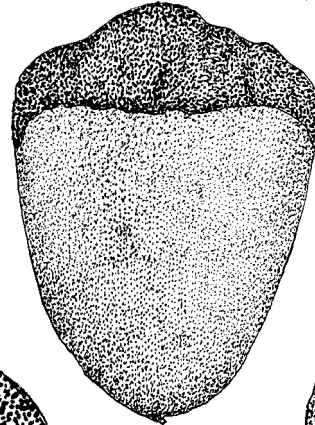
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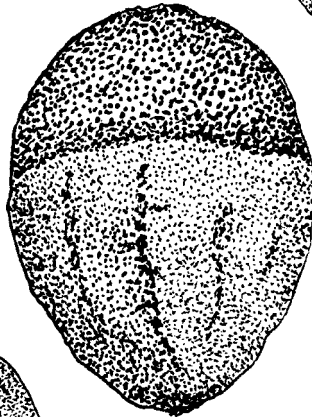


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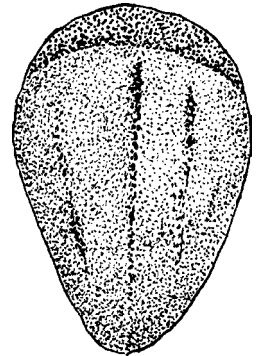


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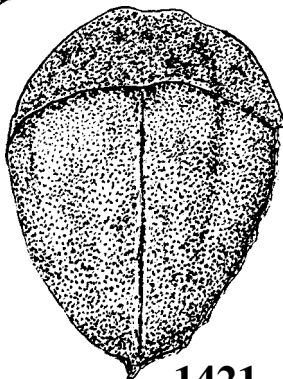
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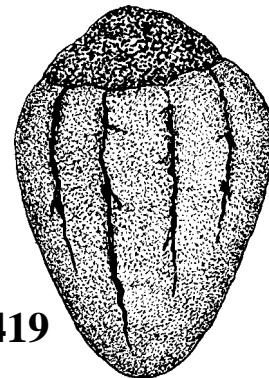
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A. J. Kern. — Shrub, 1-2.5 m high, young twigs downy, later on hairless, lustrous, red-brown. **Pyrenes obovate to globular, apex obtuse, base acute, 4.8-5.5 x 3.5-4 mm. Surface of the apex and the ventral part lustrous, dorsal part dull, brown. 2n = 68.** Native to northern, central and eastern Europe, northeastern Asia, in woodlands, thickets, southern slopes. Hu, Mo, Pl, Ro, Sk, Uk.

**1423. *Cotoneaster microphyllum*** Wall. ex Lindl. — Shrub, low up to 1 m high. **Pyrenes ellipsoid, apex obtuse often with a rest of the style, 4.3-4.8 x 3-3.5 mm. Surface of the apex and the ventral part lustrous, bottom of the dorsal part dull, light-brown.** Originally spread from the Himalayas; as the ornamental cultivated in parks among rocks.

**1424. *Cotoneaster salicifolius*** Franch. — Shrub, up to 5 m high, leaves 1-2 x 3-8 cm long, overwintering to persistent fruits c. 5 mm, red, with 2-3 stones. **Pyrenes ± semispherical, dorsal side convex, ventral side flattish, with longitudinal rib or furrow, 3-3.5 x 2.1-2.5 mm. Surface of upper part whitish-yellow, dull, acuminate, lower part reddish-brown with stalklet, lustrous.** Native to western China; in the Carpathians cultivated in parks, town verdure and gardens as decorative.

**1425. *Cotoneaster tomentosus*** Lindl., *Mespilus tomentosa* Aiton — Shrub, up to 3 m high, young twigs dense downy. **Pyrenes obovoid, fine hirsute at ventral side, apex obtuse, bottom part acute, 4.8-5.4 x 3-3.5 mm. Surface dull, brown. 2n = 51, 68, c. 85.** Native to central and southern Europe and western Asia, in dry stony places; mainly in mountains. Hu, Pl, Ro, Sk.

**1426. *Cotoneaster zabellii*** Schneid. — Shrub, up to 2 m high, twigs brownish-grey, young twigs pinkish-grey, fruits obovoidal, 7-8 mm long, light-red, with 2 stonelets. **Pyrenes ellipsoid, convexo-concave, upper part often larger than the bottom, 5.5-6.5 x 4.2-4.8 mm. Surface of the bottom dorsal part dull, rough, dark-brown, upper and ventral sides lustrous, smooth, pale-brown.** Native to China; in the Carpathians rarely cultivated in parks.

**1427. *Cydonia oblonga*** Mill., *C. vulgaris* Pers. — Shrub or tree, 2-6 m high, young twigs hirsute, glabrous later on. **Seeds semiellipsoid, flattish, apex obtuse, one-sided pointed, 7-9.5 x 3.5-4.2 mm. Surface glabrous or slight wrinkly, reddish-brown. 2n = 34.** Originally growing in central Asia, in

forests and shrubs; widely cultivated for its edible fruit, naturalized in hedges and thickets. Hu, Pl, Ro, Sk, Uk.

**1428. *Chaenomeles japonica*** (Thunb.) Lindl., *Cydonia japonica* (Thunb.) Pers. — Shrub, up to 3 m high, twigs ± thorny, downy at young stage. **Seeds obovoid, apex rounded, base constricted, 6-8 x 3-4 mm. Surface smooth, glabrous, lustrous, dark-reddish. 2n = 34.** Originally growing in eastern Asia; often cultivated in parks as an ornamental and in gardens for its fruits, uniquely naturalized.

**1429. *Chaenomeles lagenaria*** (Loisel) Koidz. — Shrub, up to 2 m high, with spreading, thorny and bare twigs, downy in young stage, fruits ovoid 3-7 cm high, yellow or yellowish-green. **Seeds ovoid, acuminate, large suture on the dorsal side, 7.2-9 x 4-5 mm. Surface glabrous, slight lustrous, blackish-brown. 2n = 34.** Native to China; in the Carpathians cultivated in parks, town verdure and gardens as an ornamental.

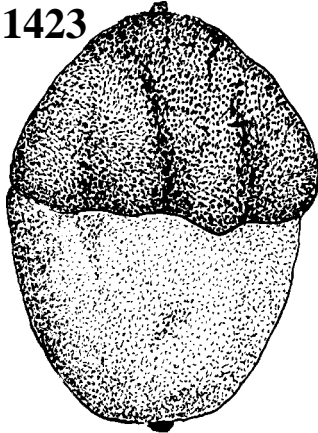
**1430. *Chaenomeles speciosa*** (Sweet) Nakai — Shrub, up to 50 cm high, twigs without thorns. **Seeds obovoid, one-sided flattish, apex obtuse, base acuminate, 6-7 x 3.3-4 mm. Surface glabrous, lustrous, light to dark-red up to blackish. 2n = 34.** Native to Japan; in the Carpathians seldom cultivated in parks and town verdure.

**1431. *Pyrus communis*** L. em. Burgsd., *P. domestica* Medik. — Tree, up to 20 m high, sometimes with thorny twigs. **Seeds obovoid, flattish, raphe inconspicuous or visible as a longitudinal ridge, apex obtuse, base acute, straight, 5-8 x 3-5 mm. Surface lustrous, fine reticulate-areolate, reddish-brown. 2n = 34 (51, 68).** Native to southwestern Asia; in all Carpathians areas cultivated in many cvs of hybrid origin.

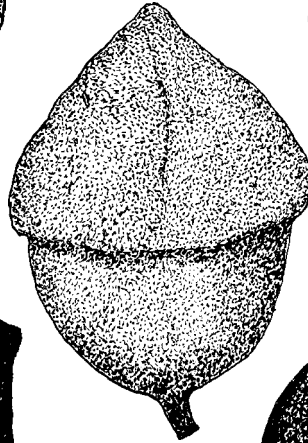
**1432. *Pyrus cordata*** Desv. — Shrub or small tree, up to 8 m high, with patent, usually spiny branches, twigs purplish. **Seeds obovoid, lateral slight compressed, with a narrowed and curved bottom, 4.5-5 x 2.6-3 mm. Surface lustreless, black.** Native to western Europe, in woods and hedges; in the Carpathians rarely planted in parks as an ornamental.

**1433. *Pyrus elaeagrifolia*** Pall. — Tree, up to 6 m high, mostly thorny, young twigs downy. **Seeds obovoid, flattish, apex obtuse, base one-sided-acuminate, 7.5-8.5 x 4.5-5.5 mm. Surface lustreless, dark reddish-black. 2n = 34.** Originally growing in

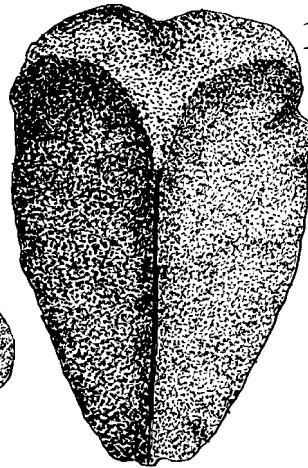
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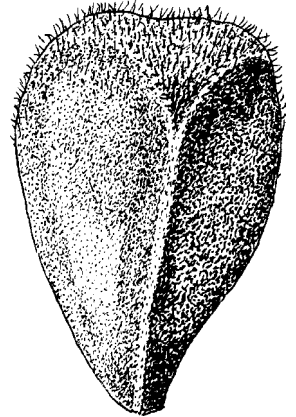
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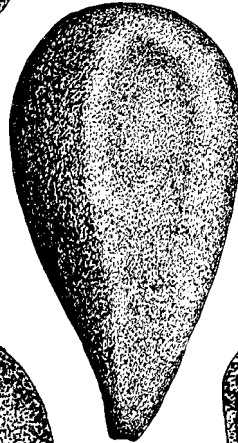
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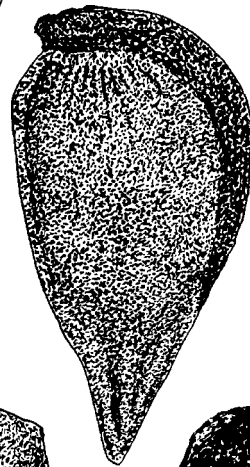
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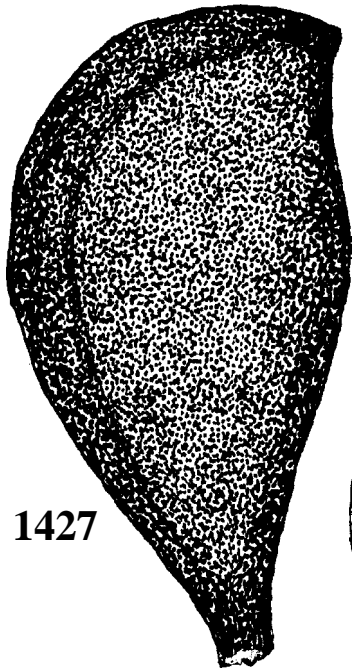
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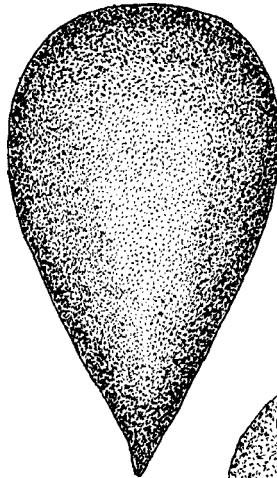
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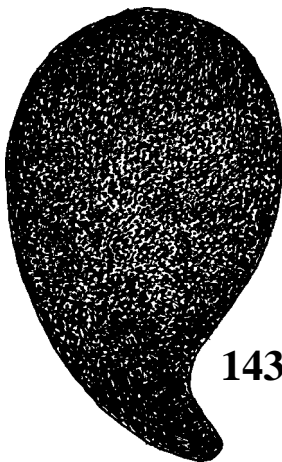
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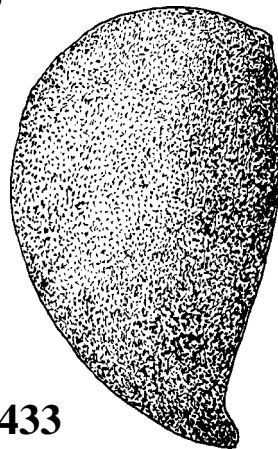
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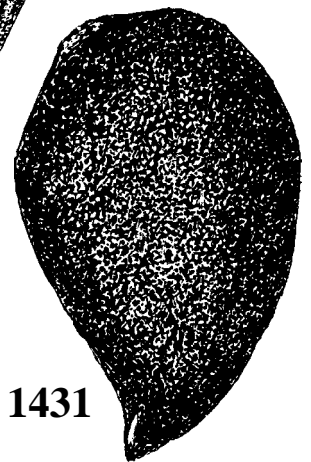
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1433



1431



Asia Minor, in dry places; in the Carpathians seldom cultivated in parks. Mo, Ro, Uk.

**1434. *Pyrus nivalis* Jacq., *P. cuneifolia* Vis.** — Tree, up to 8-20 m high, twigs ascendent, without spines, at young stage white-downy. **Seeds obovoid, apex obtuse, base acuminate, 7-8 x 4-5 mm. Surface one-sided-flattish, lustreless, reddish-brown up to black. 2n = 34.** Native to central Europe as far as the southern Mediterranean, on sunny slopes and dry woody steppes; often planted in parks. Hu, Ro, Sk.

**1435. *Pyrus pyrastrer* (L.) Burgsd., *P. achras* Gaertn.** — Tree, 8-20 m high, twigs often thorny, brown. **Seeds obovoid, one-sided-flattish, apex obtuse, base constricted, 6-8 x 4-5 mm. Surface glabrous, slight lustrous, reddish-brown to black. 2n = 34.** Native to central and southern Europe, in thickets and open woods; in all Carpathian territories, mother species of some cultivated cvs. Hu, Mo, Ro, Sk.

**1436. *Pyrus salicifolia* Pall.** — Tree, up to 8 m high, with slender saggy branches and twigs, dense hairy in the first year. **Seeds obovoid, one-sided-flattish, apex obtuse, base acuminate, 6-7 x 4-5 mm. Surface slight lustrous, reddish-brown.** Native to south-eastern Europe and western Asia; in the Carpathians planted for ornament in parks and gardens, rare. Hu, Mo, Ro.

**1437. *Pyrus syriaca* Boiss.** — Small, round-headed tree, up to 10 m high, with spiny branches, twigs grey, but reddish-brown when young, always glabrous. **Seeds obovoid, lateral slight compressed, on ventral side with a furrow deflected on one side, 7-8 x 4-5 mm. Surface smooth, lustreless, dark-brown.** Native to southwestern Asia; in the Carpathians planted locally in parks, occasionally naturalized.

**1438. *Pyrus ussuriensis* Maxim.** — Shrub or tree, up to 5-15 m high, leaves ovoid or roundish-ovoid, fruits spherical, 3-4 cm in diam. **Seeds obovoid, lateral compressed, gradually narrowed bottom with hilum, 7-7.5 x 4.8-5.2 mm. Surface smooth, lustreless, dark- to blackish-brown.** Native to eastern Asia (China, Korea); in the Carpathians rarely cultivated in parks and gardens for its edible fruits. Uk.

**1439. *Sorbus aria* (L.) Crantz, *Crataegus aria* L.** — Tree, up to 25 m high with a wide corona or a shrub, bark black-grey, smooth. **Seeds obovoid, one-**

**sided-flattish, apex obtuse, base constrict, slight curved to hooked, 5-6.2 x 3.1-3.7 mm. Surface dull, glabrous, fine reticulate, reddish-brown. 2n = 34.** Originally growing in Euro-Siberia, in mixed, dry woodlands, rocky mountains forests, in shallow, stony soils. Hu, Mo, Pl, Ro, Sk, Uk.

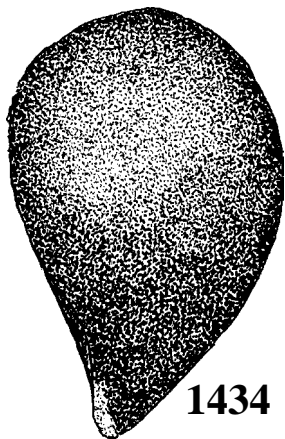
**1440. *Sorbus aucuparia* L.** — Tree, up to 15-20 m high, buds hirsute to downy, bark smooth. **Seeds prolonged elliptic to obovoid, one-sided-flattish, raphe as a longitudinal ridge, apex obtuse with a distinct boss, base constrict, slight curved 3.5-4.5 x 1.5-2 mm. Surface glabrous, fine longitudinal furrowed, reddish-brown. 2n = 34.** Native to Euro-Siberia, common in woods and on high mountain rocky stands; in the whole Carpathians.

**1441. *Sorbus austriaca* auct. (p.p.) non (Beck) Hedl.** — Shrub, up to a small tree. **Seeds elliptic, slight flattish, raphe as longitudinal ridge, apex with a boss, base constricted, slight curved, 4.5-5.5 x 2.8-3.2 mm. Surface dull, fine longitudinal furrowed, dark-brown.** Native to the eastern Alps, the Carpathians and the Balkan Peninsula, in light woodlands and shrubberies. Hu, Ro, Sk.

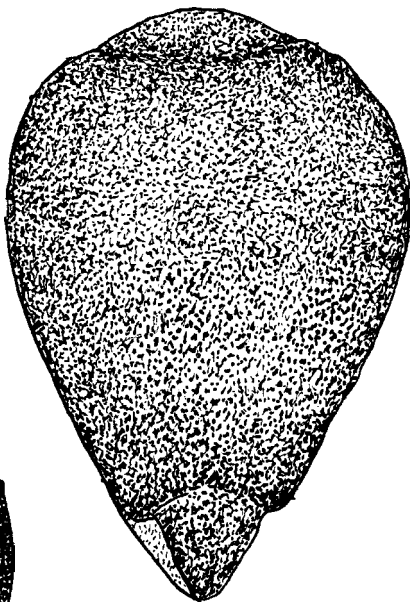
**1442. *Sorbus borbásii* Jáv., *S. hybrida* Heuffel** — Shrub, similar to *S. dacica*, young shoots whitish tomentose. **Seeds ± crescent-shaped or ellipsoid, lateral slight compressed, with distinct apex and slight curved bottom, 4.7-5.3-2.5-2.7 mm. Surface faint wrinkly, slight lustrous, reddish-brown.** Native to Romania and the Balkan countries, on maritime steep rocks, coastal rocky woods, in calcareous places, rare. Ro.

**1443. *Sorbus chamaemespilus* (L.) Crantz, *Mespilus chamaemespilus* L.** — Shrub, up to 2-3 m high, twigs reddish-brown, buds glabrous, scales ciliate. **Seeds prolonged elliptic to obovoid, distinct boss, base constrict, slight curved, 6-7.5 x 2.5-3.5 mm. Surface glabrous, fine longitudinal furrowed, dark-brown to black. 2n = 34 (51).** Native to central and southern Europe mountains, light-requiring shrub, scattered in rocks and screes. Pl, Ro, Sk.

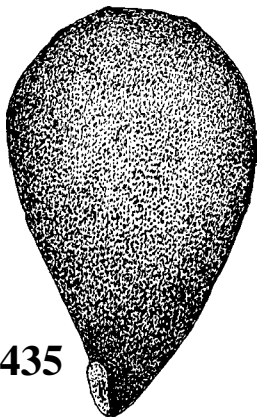
**1444. *Sorbus dacica* Borbás, *S. semipinnata* Borbás, *S. latifolia* auct. non Schul** — Tree or shrub, 2-9 m high, young shoots whitish tomentose. **Seeds prolonged obovoid, lateral slight compressed, with a distinct apex and narrowed slight curved bottom, 5.2-5.6 x 2.8-3.2 mm. Surface longitudinal shallow wrinkly, faint lustrous, reddish-brown.** Native to



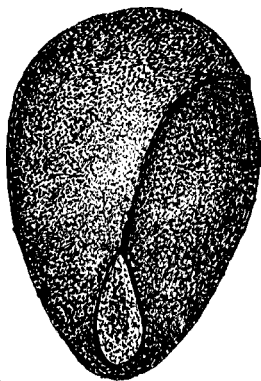
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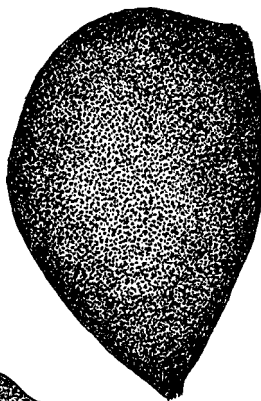
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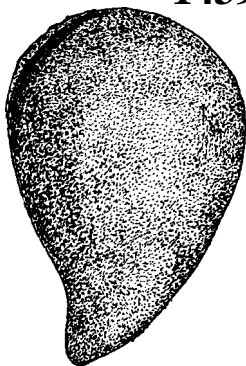
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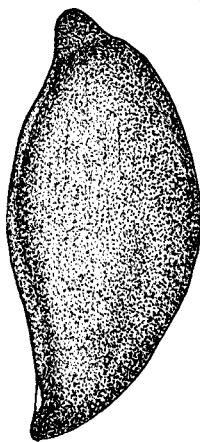
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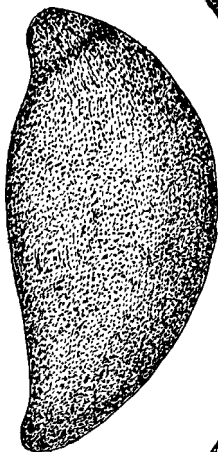
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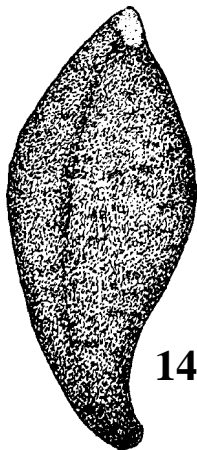
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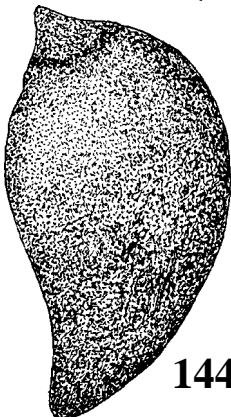
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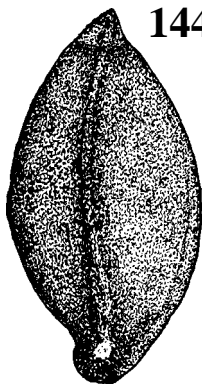
1442



1443



1444



1441



Romania (endemic), on stony and gravelly places, wharfs, steep slopes, on calcareous stands.

**1445. *Sorbus danubialis*** (Jáv.) Kárpáti, *S. cretica* f. *danubialis* Jáv. — Shrub or a small tree, 2–5 m high. **Seeds prolonged obovoid, apex obtuse with a distinct boss, base constricted, mostly curved, 5.5–6 x 3–3.5 mm. Surface slight lustrous, very fine longitudinal furrowed, dark reddish-brown. 2n = 34.** Native to the Pannonian plane and the Balkan Peninsula, on xerothermic rocky planes, often as a solitary on rocky steppes. Hu, Ro, Sk.

**1446. *Sorbus domestica*** L., *Cormus domestica* (L.) Spach — Tree, up to 15 m high, branches ± saggy, bark cracked. **Seeds broad obovoid, both sides strong flattish, with a longitudinal ridge on ventral side, apex rounded with a distinct boss, base constricted, curved, 6–7 x 4.4–5 mm. Surface reddish-brown. 2n = 34.** Native to southern and southeastern Europe, in light woodlands; planted for its fruit in gardens and vineyards. Hu, Mo, Pl, Ro, Sk, Uk.

**1447. *Sorbus graeca*** (Spach) Kotschy, *S. cretica* (Lindl.) Fritsch — Shrub or small tree, similar to *S. aria*. **Seeds elliptic, one-sided-flattish, both-sided-constricted, with a distinct boss at the apex, base pointed, 5.5–6.2 x 3.2–3.8 mm. Surface slight lustrous, glabrous, fine furrowed, light to dark reddish-brown. 2n = 34.** Native to central and south-eastern Europe, in bushy forests and steppe slopes. Hu, Ro, Sk.

**1448. *Sorbus intermedia*** (Ehrh.) Pers., *S. scandica* (L.) Fries, *S. suecica* (L.) Krok et Alm. — Tree, up to 10 m high. **Seeds obovoid, one-sided-flattish, apex rounded, with a boss on top, base constricted, strong curved, 5.6–6 x 2.6–3.4 mm. Surface lustrous, fine longitudinal furrowed, reddish-brown. 2n = 68.** Native to northern Europe; often planted in parks and alleys. Br, Pl.

**1449. *Sorbus mougeotii*** Soy.-Willem et Godr., *Aria mougeotii* Beck — Tree, up to 20 m high, shoots and buds glabrous, leaves oval or subroundish, fruits spherical, 10–13 mm, red. **Seeds ellipsoid, slight compressed, apex with a narrow collar and beak, 5–5.5 x 2.8–3.2 mm. Surface longitudinal, dense and shallow furrowed, dull, dark-brown.** Native in Europe, to woods, rock, steep slopes, from montane to subalpine zones. Ro.

**1450. *Sorbus pannonica*** Kárpáti, *S. aria-cretica* — Shrub, leaves ovoid or ovoid-lanceolate, up to 11.5 x 9 cm, rounded, serrate at base. **Seeds obovoid, with small humplet at apex, slight narrowed and curved bottom, 5.5–6 x 2.8–3.2 mm. Surface faint longitudinal furrowed, faint lustrous, reddish-brown.** Native to Slovakia (endemic), in leafy or mixed woods, in upland and montane zones.

**1451. *Sorbus torminalis*** (L.) Crantz, *Crataegus torminalis* L., *Pyrus torminalis* Ehrh. — Tree, up to 25 m high, bark scaled, young twigs tomentose. **Seeds obovoid, one-sided-flattish, apex acute with a small boss, base constricted, 6–7.5 x 3.5–4.3 mm. Surface dull, longitudinal furrowed, dark-brown. 2n = 34.** Native to Europe, Asia Minor, North America, in mixed and deciduous woodlands, calcareous soils. Suitable for parks and alleys. Hu, Mo, Pl, Ro, Sk, Uk.

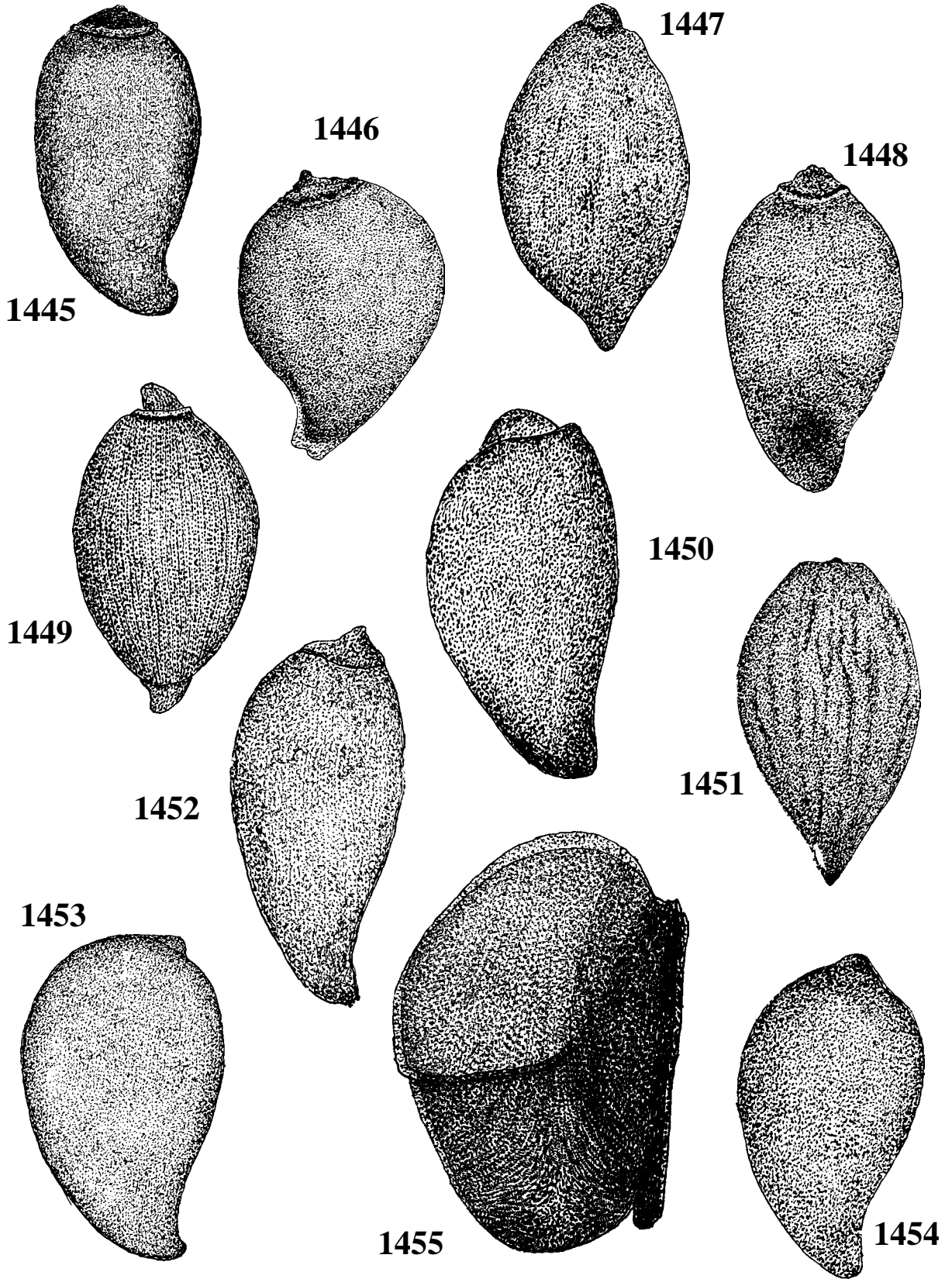
**1452. *Sorbus x tuzsoniana*** Kárpáti — Shrub or tree, up to 10 m high, leaves up to 20 cm long, bare above, dense greyish-felty beneath, fruit globular, c. 1.3 cm in diam., reddish. **Seeds prolonged obovoid, flat on one side, apex roundish with a boss, bottom gradually narrowed with an indistinct hilum, 4.4–4.8 x 2–2.4 mm. Surface fine striate longitudinal, faint lustrous, reddish-brown.** Native to the montane zone of the Carpathians. Hybrid origin (*Sorbus aucuparia* subsp. *lanuginosa* x *hazslinszkyana*). Sk.

**1453. *Aronia arbutifolia*** (L.) Ell. — Shrub, up to 3 m high. **Seeds obovoid, one-sided-flattish, apex obtuse, base constricted, 3–3.5 x 1.8–2.2 mm. Surface longitudinal furrowed, light- to dark-brown and black.** Native to North America; in the Carpathians seldom cultivated in parks and town verdure.

**1454. *Aronia melanocarpa*** (Michx.) Elliott, *Sorbus melanocarpa* (Michx.) Heynh., *Pirus melanocarpa* Willd. — Shrub, 50–150 cm high. **Seeds obovoid, one-sided-flattish, apex rounded, base constricted, 3–3.8 x 1.5–2 mm. Surface fine longitudinal furrowed, glabrous, violetish-brown to black.** Native to North America, seldom cultivated as tree (after inoculation on understock) in parks and town verdure, in several cvs.

**1455. *Pyracantha coccinea*** M. J. Roemer, *Cotoneaster pyracantha* (L.) Spach. — Shrub, up to 2–3 m high, fruits 5–7 mm, bright-red. **Pyrenes ellipsoid, angular, planoconvex, dorsal side convex,**





**ventral rooflike, 2.6-2.8 x 1.7-1.9 mm. Surface upper part waved, dull, bottom smooth, lustrous, yellowish or pale-brown.  $2n = 34$ .** Native in Front Asia; in the Carpathians widely cultivated in town verdure, in warmer areas, for its ornamental and rich flowers and fruits.

**1456. *Pyracantha crenulata* (Roxb.) Roem.** — Shrub or small tree, squeamish, fruits 6-8 mm, orange-red. **Pyrenes ellipsoid, angular, planoconvex, 2.6-3 x 1.5-1.7 mm. Surface fine waved, lustreless, yellowish-brown and dark-brown.** Native to the Himalayas and southwestern China; in the Carpathians rarely cultivated in parks and town verdure.

**1457. *Malus baccata* (L.) Borkh., *Pyrus baccata* L.** — Tree, up to 12 m high, with a rounded corona. **Seeds obovoid, one-sided-flattish, apex obtuse, base slight curved, 4-5 x 2-2.5 mm. Surface lustrous, longitudinal shallow furrowed, light-brown.  $2n = 34$ .** Originally spread from eastern Asia; in the Carpathians commonly planted in parks as a decorative ornamental woody tree.

**1458. *Malus coronaria* (L.) Mill., *Pyrus coronaria* L.** — Tree, up to 5-10 m high, shoots tomentose, glabrous later on, brown-reddish. **Seeds obovoid, dorsal side convex, ventral flat, bottom gradually narrowed acuminate, 7.2-9 x 4-5 mm. Surface smooth, slight lustrous, brown to dark-brown.** Native to North America; in the Carpathians rarely cultivated in parks and gardens for decoration.

**1459. *Malus domestica* Borkh., *M. pumila* var. *domestica* (Borkh.) C. K. Schneid.** — Tree, twigs without thorns, young twigs downy. **Seeds prolonged obovoid, flattish, apex obtuse, base constricted, 6.5-7.5 x 3.5-4.1 mm. Surface fine reticulate-lineate, nut- to reddish-brown.  $2n = 34, 51, 68$ .** The apple-tree is of hybrid origin, and has probably been derived from *M. sylvestris*, *M. dasyphylla*, *M. praecox* and some Asiatic species. More than a thousand cultivars are grown; cultivated for its fruit throughout the Carpathians, in many cvs.

**1460. *Malus floribunda* Siebold ex Van Houtte, *Pyrus pulcherrima* Asch. et Graebn.** — Perennial or tree, 4-10 m high, blooms very abundantly. **Seeds prolonged obovoid, one-side-flattish, apex obtuse, base constricted, curved, 4.4-5.2 x 2-2.5 mm. Surface slight lustrous, longitudinal shallow furrowed, yellowish-brown.  $2n = 34$ .**

Probably endemic to Japan; in the Carpathians seldom cultivated in parks and orchards arrangements.

**1461. *Malus halliana* Koehne, *Pyrus halliana* Hort. ex Voss.** — Small tree, shoots dark-brown, pubescent at first, glabrous later on, flowers solitary. **Seeds beet-shaped or obovoid, dorsal side convex, ventral flat or slight concave, with an acuminate bottom part, 4.4-4.8 x 2-2.4 mm. Surface smooth, lustrous, reddish-brown.** Native to Japan; in the Carpathians very rarely cultivated in parks and gardens as an ornamental. Ro.

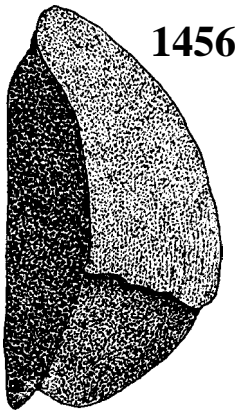
**1462. *Malus praecox* Borkh.** — Shrub or tree, up to 12 m high, thickly ramified from base. **Seeds broad obovoid, apex rounded, base constricted, 6.7-7.3 x 4.5-5 mm. Surface fine reticulate-lineate, slight lustrous, dark-brown.** Native to eastern Europe and Front Asia, in mixed and deciduous woodlands, shrubberries along rivers. Mo, Ro, Uk.

**1463. *Malus prunifolia* (Willd.) Borkh.** — Tree, up to 10 m high, young twigs hirsute, glabrescent later on. **Seeds prolonged elliptic to obovoid, one-side-flattish, suture on ventral side, apex rounded, base straight or slight curved, 5-6 x 2.5-3 mm. Surface longitudinal shallow furrowed, pale- to dark-brown.  $2n = 34$ .** Originally spread from Siberia, China; in the Carpathians occasionally planted in parks and gardens as an ornamental. Mo, Ro, Uk.

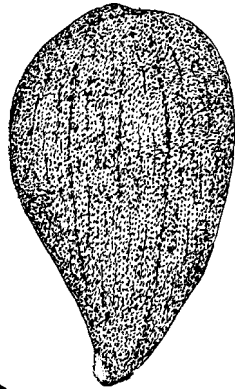
**1464. *Malus pumila* Mill., *Pyrus pumila* Hort.** — Tree, up to 10 m high, corona spherical, without thorns. **Seeds obovoid, sometimes flattish on one side, bottom gradually narrowed, acuminate, 6.8-7.2 x 3.8-4.2 mm. Surface very fine striate, faint lustrous, brown or reddish-brown.** Native to Europe, in woods, wood margins, mostly on southern regions, in many var. and cvs cultivated in orchards; throughout the Carpathians.

**1465. *Malus sargentii* Rehd.** — Shrub, up to 2 m high, with horizontally spreading twigs, fruits c. 1 cm in diam., dark-red. **Seeds obovoid, bottom gradually narrow, acuminate, 3-3.9 x 2.1-2.5 mm. Surface glabrous, lustrous, reddish-brown.** Place of origin Japan; in the Carpathians rarely cultivated in parks.

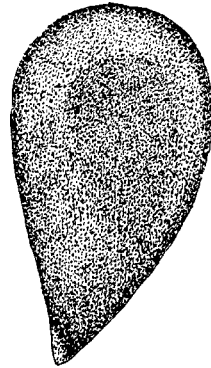
**1466. *Malus spectabilis* (Ait.) Borkh., *Pyrus spectabilis* Ait.** — Tree, up to 8 m high, young shoots tomentose, glabrous later on. **Seeds ovoid, lateral slight compressed, blunt acuminate, 3-3.6 x 2.2-2.5 mm. Surface shallow longitudinal**



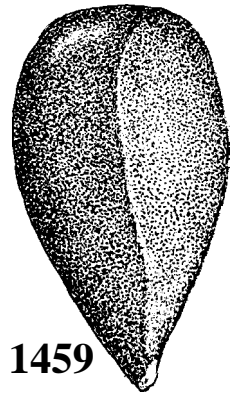
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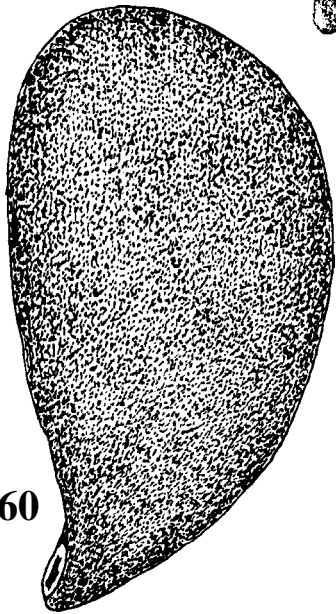
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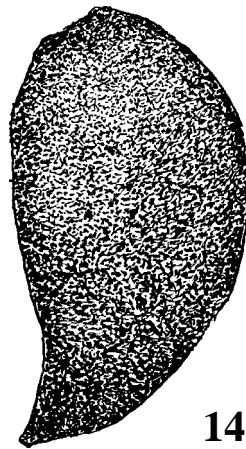
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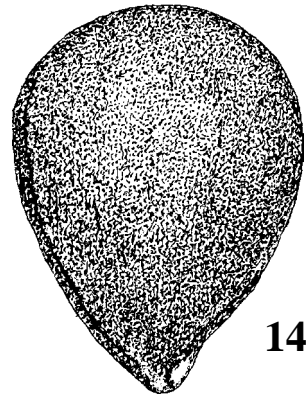
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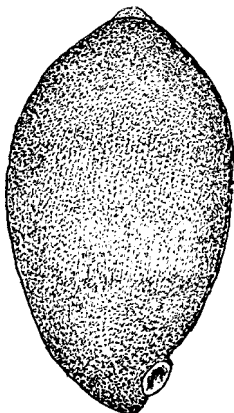
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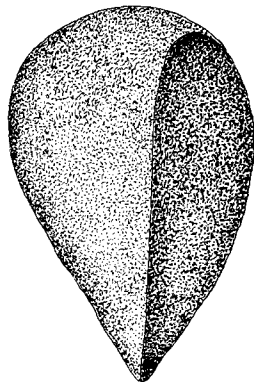
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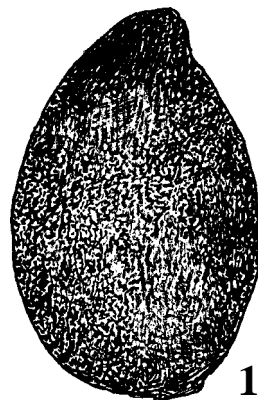
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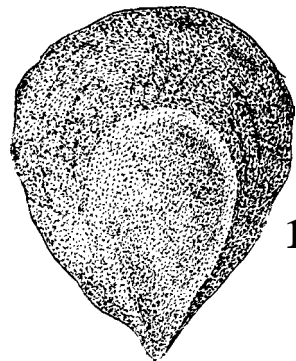
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1466



1465

**furrowed, glossy, pale-brown.** Native to Japan and China; in the Carpathians rarely planted in parks as an ornamental.

**1467. *Malus sylvestris* Mill., *M. acerba* Mérat, *Pyrus malus* L.** – Shrub or tree, up to 10 m high,  $\pm$  spiny twigs. **Seeds prolonged obovoid, one-sided-flattish, raphe inconspicuous, 5.5-6.5 x 3.5-4 mm. Surface slight lustrous, fine reticulate-lineate, nut-brown.  $2n = 34$ .** Native to most of Europe, in forests, mixed scrubs, rocky slopes along streams, field edges; cultivated as a rootstock for apple cvs, throughout the Carpathians.

**1468. *Malus toringo* Siebold, *Pyrus sieboldii* Rgl.** – Shrub, up to 4 m high, rarely tree, with divergent branches. **Seeds elliptic to obovoid, one-sided-flattish, apex usually with a small boss, 2.8-3.2 x 1.5-1.8 mm. Surface lustrous, longitudinal furrowed, yellowish to brown.** Native to Siberia, China and the Himalayas; in the Carpathians rarely cultivated in parks and gardens.

**1469. *Malus x purpurea* (Barbier) Rehder** – Bigger shrub or smaller tree, twigs long, when young the bark is dark-red to dark-purple. **Seeds elliptic or obovoid, rounded or compressed at one side, bottom narrow, 4.6-5 x 2.5-2.9 mm. Surface fine striate, dull or faint lustrous, brown.** Hybrid obtained in France (*Malus x atrosanguinea x niedzwetzkyana*), for its nice purple-red flowers cultivated in parks as an ornamental species.

**1470. *Crataegus azarolus* L., *Azarolus crataegoides* Borkh.** – Shrub, up to 8 m high, young twigs tomentose, spiny, fruits globular to pyriform, red or orange, 1.5-2 cm in diam. **Pyrenes ellipsoid, planoconvex, convex side with 3-4 broader furrows, 9-10 x 7-8 mm. Surface smooth, rough, dull, light-brown.** Native to southern Eurasia, north Africa; in the Carpathians rarely cultivated in parks and gardens for its edible fruits.

**1471. *Crataegus calycina* Peterm.** – Shrub or a small tree, up to 5 m high, twigs glabrous, purplish- or cinnamon-brown, spines up to 13 mm, or absent. **Pyrenes ovoid, biconvex, ventral side with longitudinal furrow, transversal section roundish, 7.5-8.5 x 5-5.6 mm. Surface dense waved, lustreless, pale-brown.** Native to Europe, on shrubby slopes, wood margins, in dry, often calcareous, stony and sandy soils of warmer areas; in all Carpathian territories.

**1472. *Crataegus crus-galli* L.** – Shrub or small tree, up to 12 m high, twigs light greyish-brown, pines 7-10 cm, thin. **Pyrenes elliptic, with two or three furrows on dorsal side, 7-8 x 4.5-5.2 mm. Surface tuberculate, lustreless, terracotta.  $2n = 48$ .** Native to North America, in thickets, pastures, borders of woods; in the Carpathians cultivated in parks as an ornamental, locally naturalized. Hu, Mo, Ro, Sk, Uk.

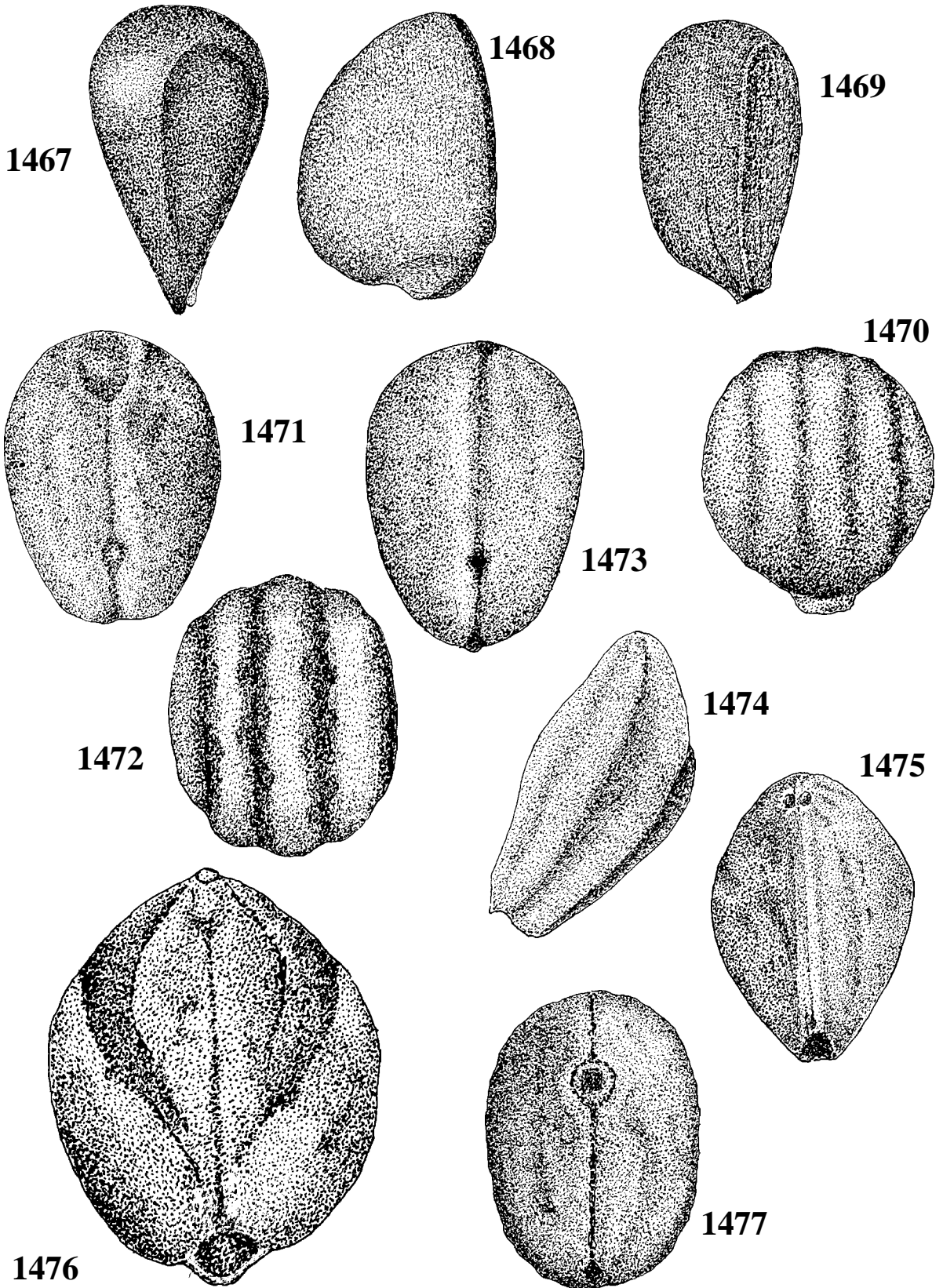
**1473. *Crataegus curvisepala* Lindman, *C. monogyna* Jacq. subsp. *curvisepala* (Lindman) Hegi** – Shrub, 4-8 m high, habitus spherical to obovoid, few thorny, 10-15 mm long. **Pyrenes obovoid, convexo-convex, sometimes with 1-3 shallow furrows, with hilum at ventral side, 7.5-8.5 x 4.9-5.5 mm. Surface rough, dull, brown.  $2n = 51$ .** Native to central and eastern Europe, in shrubby communities of upland and montane zones; in the whole Carpathians.

**1474. *Crataegus flabellata* (Bosc) C. Koch, *Mespilus flabellata* Bosc** – Shrub, up to 7 m high, bark grey, young twigs greenish, reddish-brown later on, thorns 4-8 cm long, 3-5 seeds (pyrenes) in fruit. **Pyrenes  $\pm$  half-moon, dorsal side convex with 2 deep and broad furrows, ventral side rooflike, 6-7 x 3-3.8 mm. Surface punctulate, dull, pale or yellowish-brown.  $2n = 68$ .** Native to North America; in the Carpathians often planted in parks.

**1475. *Crataegus intricata* Lange, *C. coccinea* auct. non L.** – Shrub, up to 3 m high, twigs bare, red-brown, thorns up to 3 cm. **Pyrenes ellipsoid, constricted toward the apex and base, with suture on ventral side, 6.5-7.5 x 4-5 mm. Surface lustreless, fine tuberculate, orange-brown.  $2n = 48$ .** Originally growing in North America; in the Carpathians cultivated in parks for ornament, rarely naturalized.

**1476. *Crataegus laevigata* (Poir.) DC., *C. oxyacantha* auct. non L.** – Shrub or tree, thorns 6-15 mm long, twigs bare, brown. **Pyrenes ellipsoid to spherical, with two incisions and suture on ventral and longitudinal tuberculate on dorsal side, 6.2-7 x 4.5-5 mm. Surface lustreless, pale-brown.  $2n = 34$ .** Native to northwestern and northcentral Europe, in woodlands, scrubs, stony sunny slopes; throughout the Carpathians.

**1477. *Crataegus lindmanii* Hrabětová, *C. calycina* auct. non Peterm., *C. curvisepala* subsp. *lindmanii* (Hrabětová) Byatt** – Shrub or small tree, up to 5 m high, thorus up to 13 mm or absent. **Pyrenes elliptic, with one furrow on ventral side, and two distinct**



on dorsal side, apex and base rounded, 7.5-8.5 x 5-5.6 mm. Surface fine tuberculate, dull, isabelline. **2n = 34**. Native to central and eastern Europe as far as Bulgaria, Russia, in light deciduous woods, shrubs. Br, Hu, Ro, Sk, Uk.

**1478. *Crataegus macrocarpa*** Hegetschw. — Shrub, with long twigs, often procumbent, spines 5-60 mm. **Pyrenes elliptic, one-sided-flattish, two or three furrows on dorsal side, suture on ventral side, apex obtuse, base constricted, 8-9 x 5-6 mm. Surface lustreless, fine tuberculate, pale-terracotta. 2n = 51**. Native to the East Alps, in shrubby slopes, forest margins, perhaps hybrid *C. curvisepala* x *laevigata*; in the Carpathians seldom planted in parks.

**1479. *Crataegus microphylla*** C. Koch — Slender shrub, twigs glabrescent, reddish, spines 5-12 mm, fruit 9-12 mm, subglobose, bright-red, pyrene one in fruit. **Pyrenes elliptic, apex with a darker cap, part under cap a little narrow and pale, bottom part gradually narrowed, 3.5-4 x 1.9-2.1 mm. Surface fine waved, dull, pale-brown, cap chocolate brown**. Native to the Caucasus, northern Iran; rarely cultivated in parks as ornamental. Mo.

**1480. *Crataegus mollis*** (Torrey et A. Gray) Scheele, *C. coccinea* var. *mollis* Torr. et A. Gray — Tree, up to 13 m high, leaves leathery. **Pyrenes (in fruit 5 pyrenes create one compact group), prolonged elliptic constrict at both ends, with one or two distinct furrows on dorsal side, 8.5-9.5 x 3.7-4.3 mm. Surface irregular tuberculate, lustreless, brown. 2n = 34, 68**. Native to North America; planted most as an ornamental in parks, gardens and for hedges.

**1481. *Crataegus monogyna*** Jacq., *Oxyacantha monogyna* (Jacq.) M. Roem. — Shrub or tree, up to 10 m high, thorns 7-20 mm, pyrene one in fruit. **Pyrenes broad ellipsoid, suture on versal side, rounded in transversal section, dorsal side with two or three indistinct furrows, 6.5-7.5 x 4-5 mm. Surface lustreless, fine tuberculate, dark-sandy. 2n = 34**. Native to Eurasia; common in the Carpathians in thickets and hedges, from lowland to montane zones. Hu, Mo, Pl, Ro, Sk, Uk.

**1482. *Crataegus nigra*** Waldst. et Kit., *Mespilus nigra* (Waldst. et Kit.) Willd. — Shrub or tree, up to 7 m high, young twigs white downy, thorns abundant, short (up to 10 mm). **Pyrenes elliptic to obovoid, ventral sides with irregular sockets**

**and suture, apex obtuse, dorsal side with keel, 5.4-6.3 x 3.2-3.6 mm. Surface tuberculate, pale-brown**. Native to eastern and central Europe; occasionally cultivated in parks, orchards and town verdure. Hu, Ro, Sk.

**1483. *Crataegus orientalis*** Pall. ex M. Bieb., *C. laciniata* Ucria — Shrub to tree, up to 9 m high, fruits vertically flattish, 5-angular, orange or orange-red, up to 15 mm in diam. **Pyrenes obovoid, flattish, dorsal side convex with 2 furrows, ventral rooflike, 6.2-7.2 x 4.2-4.8 mm. Surface waved, dull, brown**. Native to southeastern Europe, western Asia, on forest margins, in shrubberies and dry slopes, submontane zone; in the Carpathians rarely cultivated in parks.

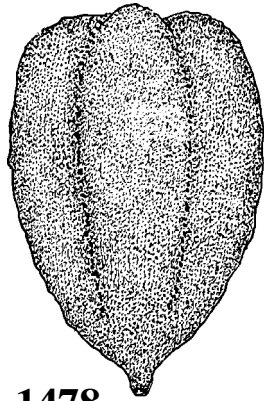
**1484. *Crataegus pentagyna*** Waldst. et Kit. — Shrub or small tree, twigs sparsely arachnoid-lanate, later glabrescent, spines c. 10 mm. **Pyrenes prolonged ovoid, ventral side rooflike with longitudinal ridge, apex narrowish, dorsal side rounded with longitudinal furrow, 5.5-6.6 x 2.5-3 mm. Surface lustreless, foveolate, brown**. Native to southern Eurasia, wood at margins. Hu, Mo, Ro, Sk, Uk.

**1485. *Crataegus pinnatifida*** Bunge — Tree, up to 7 m high. **Pyrenes elliptic to globular, ventral side with two sockets and suture, dorsal with 2 or 3 furrows, 6-7 x 5.5-6 mm. Surface lustreless, fine tuberculate, terracotta**. Native to Europe and western Asia; in the Carpathians cultivated in parks and orchards. Mo, Uk.

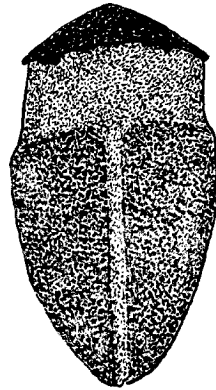
**1486. *Crataegus sanguinea*** Pal. L. — Shrub or tree, up to 7 m high, twigs glabrous, purple, thorns absent or small. **Pyrenes elliptic to obovoid, with suture on ventral and one or three keels on dorsal side, 5.5-6 x 3.6-4 mm. Surface fine tuberculate, terracotta**. Native to central and eastern Russia and Kazakhstan; rarely planted in parks and orchards of the Carpathians. Mo, Uk.

**1487. *Crataegus stevenii*** Pojark. — Shrub, up to 1-1.5 m high, leaves deeply cutting up to middle vein on 5-9 lobes. **Pyrenes (in fruit only 1 pyrene), ellipsoid, 3-5 furrows on each half, upper part slight narrowish, 8.5-9.5 x 5.8-6.4 mm. Surface coarse, dull, brown**. Native to eastern Europe, on dry slopes, light forest margins; in the Carpathians rarely cultivated in parks as a decorative. Uk.

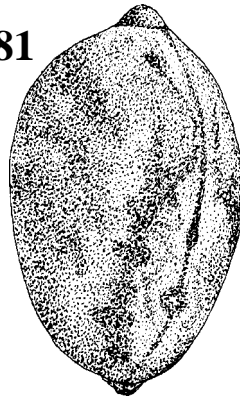
**1488. *Crataegus x fallacina*** Klokov — Shrub up to tree, 3-7 m high, habitus obovoid, up to irregular, twigs scarcely thorny, thorax 10-15 mm long,



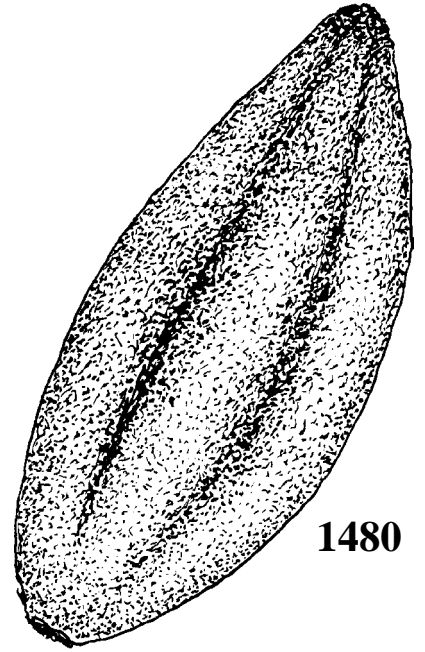
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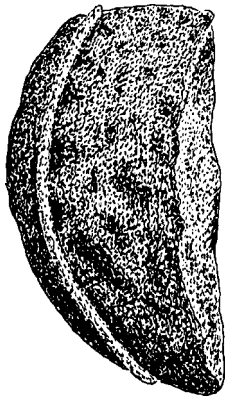
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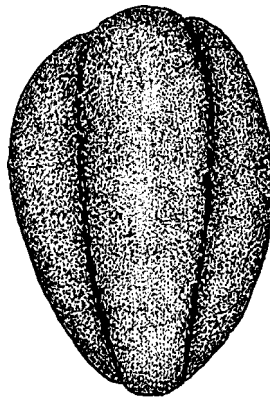
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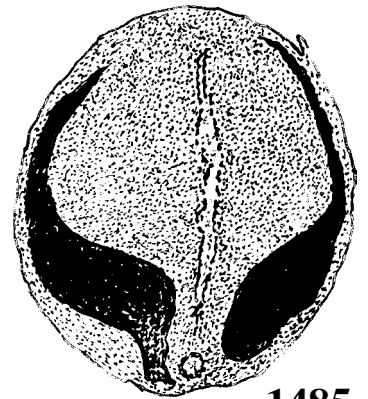
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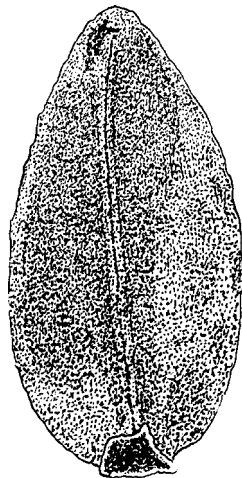
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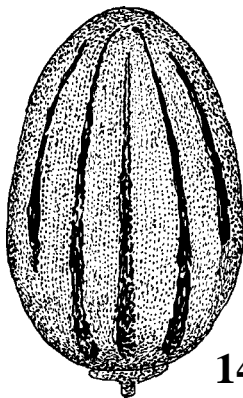
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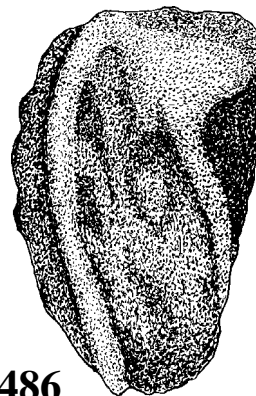
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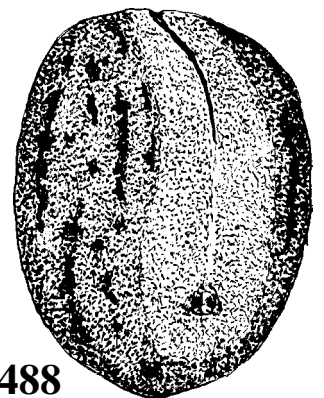
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1488



fruit 1-seedy. **Pyrenes ellipsoid, dorsal side convex with 4 furrows, ventral side flat with 1 furrow and hilum, 7-8 x 5-6 mm. Surface humpy, dull, pale-brown. 2n = 68.** Hybrid origin (*Crataegus monogyna* x *curvisepala*), in shrubby communities, along wood margins, forest and field ways, felled areas. Sk, Uk.

**1489. *Crataegus x palmstruchii*** Lindman, *C. oxyacantha* L. subsp. *palmstruchii* (Lindman) Hrabětová-Uhrová – Shrub, up to 2-4 m high, habitus obovoid to irregular, twigs with many thorns, up to 10 mm long. **Pyrenes globular or semiglobular, with 5 or 10 furrows, bottom with violet hilum, 6.5-7.5 x 5.5-5.9 mm. Surface dull, pale-brown. 2n = 51.** Hybrid origin (*Crataegus laevigata* x *lindmanii*), in upland and montane zones of the Carpathians, on dryer stands, shrubberies, wood margins, pastures, rarely as solitaire.

**1490. *Mespilus germanica*** L., *M. vulgaris* Rchb. – Shrub or tree, up to 6 m high, wild with spiny twigs, young twig downy. **Pyrenes ovoid to triangular, flattish, with two keels on dorsal and suture on ventral side, 10-12 x 7-8 mm. Surface tuberculate, reddish-brown. 2n = 34.** Native to south-eastern Europe; since longtime cultivated for its fruits and naturalized in western and central Europe; the Carpathians included.

**1491. *Amelanchier canadensis*** (L.) Medik. – Shrub, up to 3 m high, fertile twigs bare, leaves obovoid or prolonged, 3-8 x 2-4 cm long, margin serrate. **Seeds obovoid or ellipsoid, lateral compressed, with a narrowed and curved bottom part, 4-4.4 x 2-2.4 mm. Surface longitudinal faint furrowed, slight lustrous, reddish or dark-brown.** Originally spread from Canada; in the Carpathians commonly planted in parks and gardens.

**1492. *Amelanchier lamarckii*** Schröd. – Tree, up to 20 m high. **Seeds obovoid, apex rounded, base curved, slight flattish, 4-4.5 x 2-2.5 mm. Surface longitudinal shallow furrowed, slight lustrous, reddish-brown.** Native to North America; in the Carpathians seldom cultivated in parks and orchards as a decorative tree.

**1493. *Amelanchier ovalis*** Medik., *A. vulgaris* Moench, *Aronia rotundifolia* Pers. – Shrub, up to 3 m, without thorns, twigs black, at young stage downy. **Seeds elliptic, flattish, apex rounded, base curved, 3.5-4 x 1.8-2.1 mm. Surface lustrous, longitudinal**

**shallow furrowed, reddish to dark-brown. 2n = 34.** Native to Europe and southwestern Asia, in stony dry places, on overgrown rocks, sunny shrubby slopes of mountain areas. Hu, Mo, Pl, Ro, Sk, Uk.

**1494. *Amelanchier spicata*** (Lam.) Koch, *Crataegus spicata* Lam. – Shrub, with procumbent and erect twigs. **Seeds elliptic to obovoid, flattish, apex usually obtuse triangular, base usually strong curved, 3.4-3.8 x 1.8-2.1 mm. Surface dull to lustrous, glabrous, fine reticulate-lineate, reddish to dark-brown. 2n = 68.** Native to North America; commonly cultivated in parks and sometimes naturalized.

## 57. MIMOSACEAE

**1495. *Mimosa pudica*** L. – Shrub, creeping, with both hooked and needle-like spines, legumes flattened, smooth, spineless, pale or dark-brown. **Fruits transverse schizocarps – above loment – one-seeded fruit segment. Seeds (right down) rounded, strong compressed, lateral flattish, with broad, strong, non-transparent margin, 2.6-3 mm in diam. Surface glabrous, slight lustrous, tobacco-brown.** Native to South Americas, often as weed in pastures, neglected lawns; in the Carpathians rarely cultivated in flowerpots as an interesting and very sensitive plant.

**1496. *Albizia julibrissin*** Durazz., *Acacia julibrissin* Willd. – Shrub or a smaller tree with ramified corona, up to 10 m high. **Seeds ellipsoid, lateral strong compressed, on lateral sides distinct ribbed around, 6-6.5 x 3.5-4 mm. Surface glabrous, lustreless, brown.** Native to Iran, India, the Himalayas, in forest zone; in warmer areas of the Carpathians rarely cultivated as an ornamental.

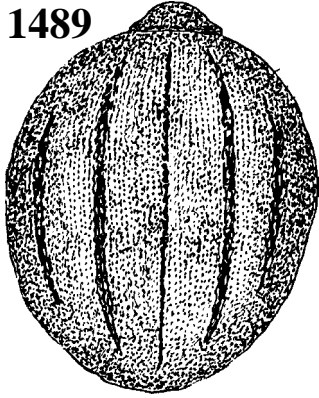
## 58. CAESALPINIACEAE

**1497. *Acacia dealbata*** Link. – Tree, up to 30 m high, bark smooth, grey, twigs and young leaves whitish-tomentose. **Seeds obovate or ellipsoid, compressed, hilum with a yellow caruncle, 4.5-5.2 x 2.8-3.2 mm. Surface with or without depressions, faint foveolate, lustrous, black.** Native to Australia; planted in warmer areas of the Carpathians for ornament, timber and soil-stabilization, uniquely naturalized.

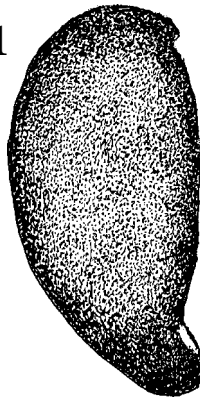
**1498. *Gleditsia caspia*** Desf. – Shrub or tree, up to 13 m high, with densely spherical corona, twigs with yellowish-green bark, husk broad, erect or crooked, 20-25 cm long. **Seeds ellipsoid, lateral compressed,**



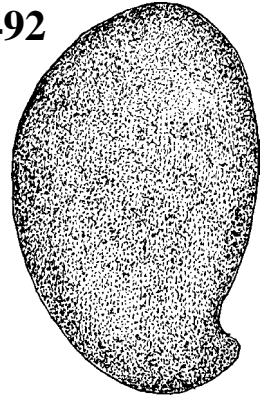
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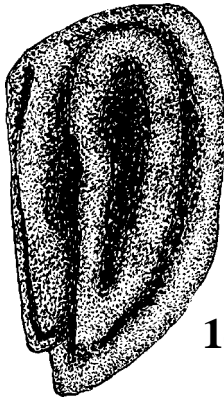
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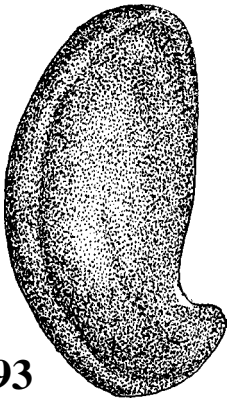
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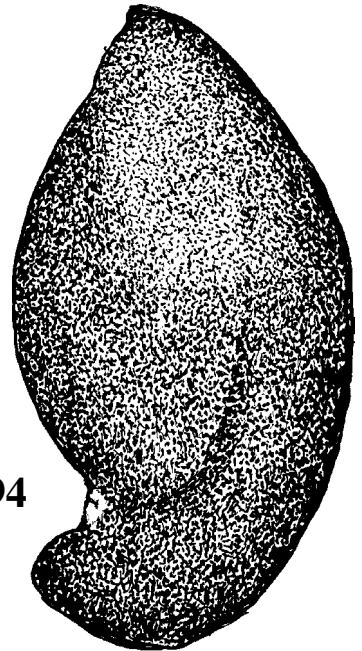
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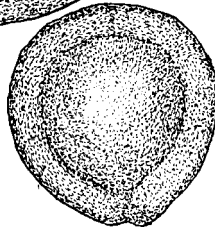
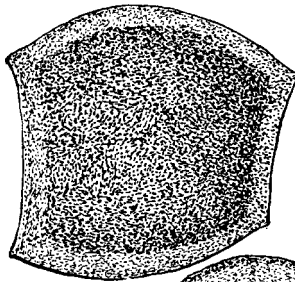
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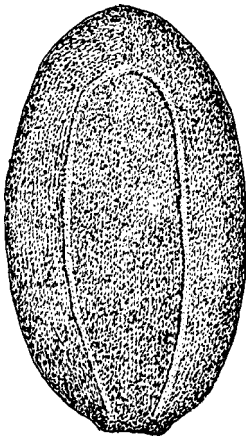
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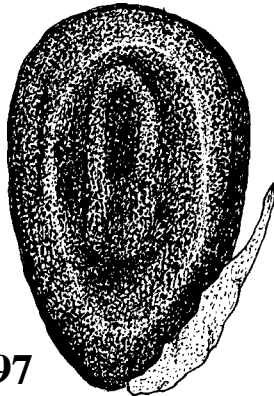
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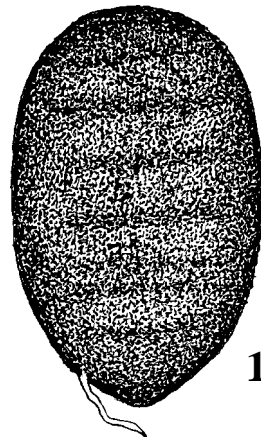
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**roundish above, narrowed below, at hilum whitish rest of funiculus, 8-9.5 x 6-7 mm. Surface glabrous, lustreless, chocolate-brown.** Native to the Caucasus, in lowland woods with dryer soils, rarely cultivated for its hard, strong wood, utilized for various purposes, rarely cultivated in parks as an interesting tree. Uk.

**1499. *Gleditsia sinensis* Lam.** — Tree, usually with thick, often ramified thorns, legume 12-25 cm long, with many seeds. **Seeds slight prolonged to spherical, lateral strong flattish, 10.5-11.5 x 9-9.6 mm. Surface glabrous, slight lustrous, pale-brown.** Native to eastern China; in the Carpathians rarely cultivated in parks as an interesting tree.

**1500. *Gleditsia triacanthos* L., *G. spinosa* Marshall** — Shrub or tree, up to 45 m high, rough, brown-red, often branched thorns on trunk and twigs. **Seeds ellipsoid, flattish, apex and base rounded, 8.5-9.5 x 6.5-7.5 mm. Surface smooth, lustrous, dark- to red-brown. 2n = 28.** Originally spread from North America, in moist places; in the Carpathians commonly cultivated as an ornamental in parks and hedges, rarely naturalized.

**1501. *Gymnocladus dioica* (L.) K. Koch, *G. canadensis* Lam.** — Tree or shrub, up to 30 m high, with a spreading corona and rough, undulated twigs without thorns. **Seeds globular, flattish, apex rounded, base constricted, 13-20 x 10-16 mm. Surface smooth, dull, grey-black. 2n = 28.** Originally growing in North America, on moist soils rich in nutrients; in the Carpathians often cultivated in parks as an ornamental and honey-plant.

**1502. *Cercis siliquastrum* L.** — Deciduous shrub or tree, up to 6-10 m high, cauliflorous, twigs glabrous. **Seeds ellipsoid to ovoid, flattish, apex deccurent, with a small boss, base truncate, 5-5.6 x 3.8-4.2 mm. Surface smooth, blackish-brown to black. 2n = 14.** Native to southeastern Europe and western Asia, on stony moist slopes, cultivated elsewhere for ornament, sometimes naturalized.

## 59. FABACEAE

**1503. *Sophora japonica* L., *Styphnolobium japonicum* (L.) Schott** — Tree, up to 2.5 m high, corona mighty, nearly rounded. **Seeds ellipsoid, slight flattish, apex slight rounded, base obtuse, 7-8 x 5-6 mm. Surface glabrous, lustrous, dark- to blackish-brown. 2n = 28.** Originally growing in China, Japan and Korea; in warmer areas

of the Carpathians cultivated as an ornamental and interesting tree in parks, gardens, streets and alleys, locally naturalized. Hu, Mo, Ro, Sk, Uk.

**1504. *Sophora jaubertii* Spach, *S. prodanii* E. Anderson** — Perennial, up to 40-100 cm, corolla pale-yellow. **Seeds ellipsoid, slight compressed, transversal section elliptic, dorsal and ventral side convex, hilum rounded or slight elliptic with brown border, 3.7-4.5 x 2.4-3 mm.** Native to Anatolia and the Caucasus; in the Carpathians rarely cultivated in parks as an ornamental.

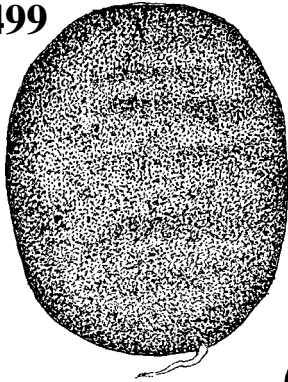
**1505. *Cladratis lutea* (Micn.) C. Koch, *C. tinctoria* Raf.** — Tree, up to 20 m high. **Seeds prolonged ellipsoid, apex and base rounded, 6.5-7 x 3.5-4 mm. Surface glabrous, lustrous, tobacco-brown.** Indigenous to the forests of the southeastern United States; in the Carpathians scarcely cultivated as an attractive ornamental tree, in parks and gardens.

**1506. *Laburnum alpinum* (Mill.) Bercht. et J. Presl, *Cytisus alpinus* Mill.** — Shrub or tree, up to 5 m high, twigs bare. **Seeds irregular reniform, lateral flattish, radicular lobe strong divergent, represented 1/3-2/3 of the cotyledonary lobe, hilum sunken, circular, often with persistent funiculus, 4.7-5.3 x 3.3-3.7 mm. Surface dull to faint lustrous, smooth, hilum chocolate-brown. 2n = 48.** Native to mountains of central and southern Europe, in rocky overgrown slopes, rarely cultivated in parks and gardens.

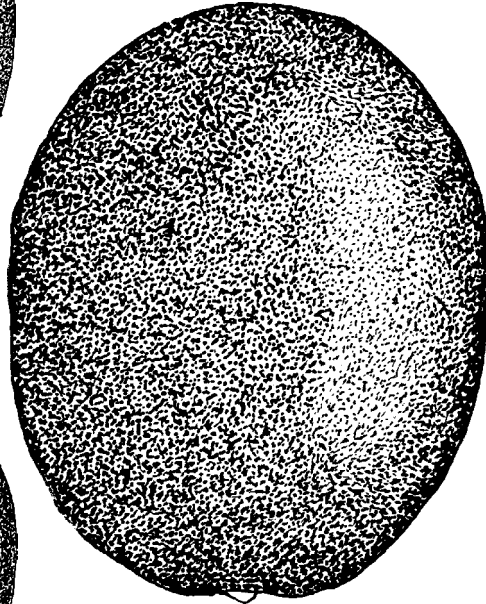
**1507. *Laburnum anagyroides* Medik., *L. vulgare* J. Presl** — Shrub or tree, up to 7 m high, twigs greyish-green, tomentose. **Seeds irregularly reniform or ellipsoid, slight flattish, radicular lobe strong divergent, longer than the cotyledonary one, 4.7-5.3 x 3.2-3.6 mm. Surface faint lustrous, smooth, black. 2n = 48.** Native to southern Europe, in mountain woods and scrubs; in the Carpathians commonly planted in parks and gardens for ornament, sometimes naturalized. Hu, Mo, Ro, Sk, Uk.

**1508. *Laburnum watereri* (Kirchner) Dipp., *L. parksii* hort.** — Shrub or tree, up to 5-7 m high, hybrid (*L. anagyroides* x *alpinum*), less tomentose than parents. **Seeds reniform, lateral flattish, apex rounded, radicular lobe longer than cotyledons, 4.2-4.8 x 3.8-4.2 mm. Surface smooth, lustrous, brown or black.** In the Carpathians rarely cultivated in parks as a ornamental plant.

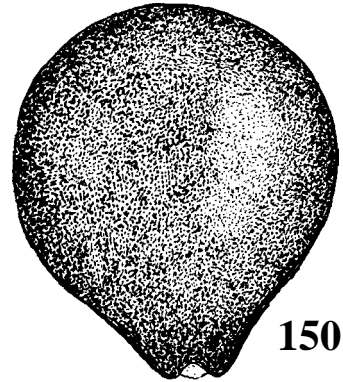
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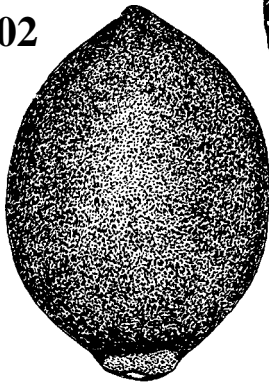
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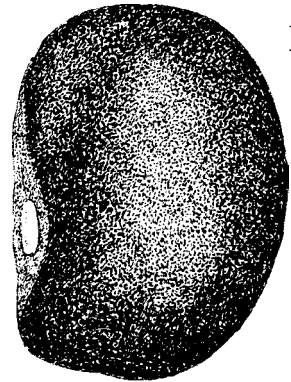
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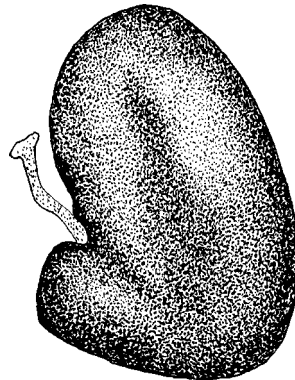
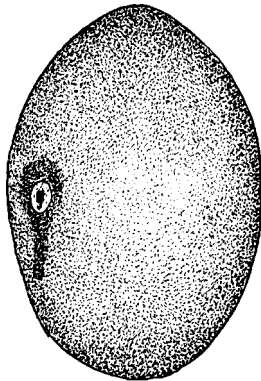
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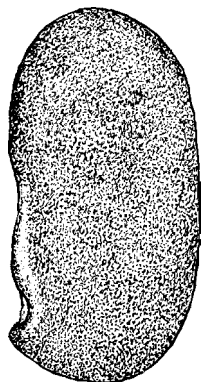
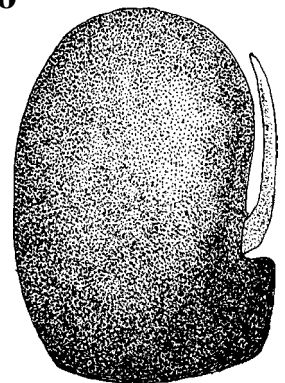


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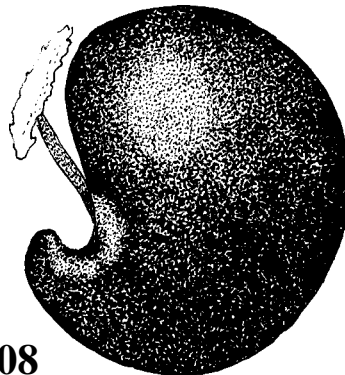
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**1509. *Ulex europaeus*** L. — Shrub, up to 2 m high, very thorned, twigs erect or ascending, dense branched. **Seeds nearly triangular, flattish, arillate, hilum basal, sunken, covered with aril, 3-3.6 x 2.3-2.6 mm. Surface glossy, smooth, greenish-brown to brown. 2n = 96.** Native to southwestern Europe; in the Carpathians rarely planted in parks and hedges, in warmer areas, widely naturalized.

**1510. *Sarothamnus scoparius*** (L.) Wimm. ex W. D. J. Koch, *Cytisus scoparius* (L.) Link — Shrub, richly ramified from the base, 50-250 cm high, twigs erect or ascendent, evergreen. **Seeds ellipsoid to ovoid, slight flattish, apex rounded, base truncate, hilum covered with aril, 3.5-4 x 2.5-3 mm. Surface smooth, lustrous, greenish-yellow to brown. 2n = 46.** Native to western and central Europe, on roadsides verges, clearings edges of woods, mountain pastures, throughout the Carpathians.

**1511. *Lembotropis nigricans*** (L.) Griseb., *Cytisus nigricans* L. — Shrub, up to 1.5 m high, branched from the base, twigs erect, hirsute. **Seeds ovoid to reniform, slight flattish, apex rounded, base truncate, hilum without aril, 2.5-3 x 2-2.5 mm. Surface lustrous, glabrous, dark-brown. 2n = 48.** Native to Europe, in light forests, shrubby slopes, overgrown rocks in downs and mountains; throughout the Carpathians.

**1512. *Coroethamnus procumbens*** (Waldst. et Kit. ex Willd.) C. Presl, *Genista procumbens* Waldst. et Kit. ex Willd. — Shrub, up to 80 cm high, twigs procumbent or ascendent. **Seeds spherical to ellipsoid, slight flattish, apex rounded, 2-2.8 x 1.7-2 mm. Surface lustrous, glabrous, brown to blackish-brown. 2n = 22.** Native to central and southeastern Europe, on overgrown rocks, sunny shrubby slopes and open woods. Hu, Mo, Ro, Sk.

**1513. *Calophaga wolgarica*** (L. fil.) Fischer, *Cytisus wolgaricus* L. fil. — Shrub, 20-100 cm high, ramified from the base, young twigs dense hirsute, old with brown bark. **Seeds ellipsoid, lateral compressed, dorsal side convex, ventral concave with a white hilum, 4.5-5 x 3.3-3.7 mm. Surface glabrous, slight lustrous, greenish or pale-brown, violet-spotted.** Native to southeastern Europe and southern Asia; in the Carpathians rarely cultivated in rock-gardens as an ornamental and interesting species.

**1514. *Calycotome infesta*** (Presl) Guss., *Spartium infesta* Presl, *Cytisus spinosus* Koch — Small shrub,

10-15 cm high, branched, twigs patent and finished with a thorn. **Seeds ± rounded, lenticular, lateral compressed, apex ± truncate, radicle little longer or the same as cotyledons, 2.4-2.6 x 2.3-2.5 mm. Surface glabrous, lustrous, dirty-yellow.** Native to the Mediterranean region, in shrubberies; in the Carpathians cultivated in gardens as an ornamental.

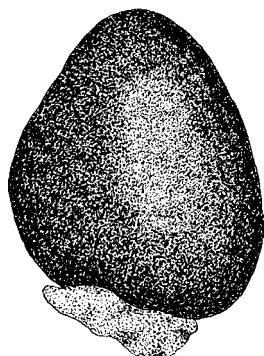
**1515. *Chamaecytisus aggregatus*** (Schur) Czer. — Shrub, 30-50 cm high, with obovoid, blunt, soft leaves, inflorescence with 4-8 flowers. **Seeds ovoid, lateral slight compressed, apex roundish, bottom ± truncate, with small aril, 3.5-3.8 x 2.7-2.9 mm. Surface smooth, lustrous, yellowish-brown.** Native to eastern Europe; the shrubberies and grassy slopes, rare. Uk.

**1516. *Chamaecytisus albus*** (Hacq.) Rothm., *Cytisus albus* Hacq., *C. leucanthus* Waldst. et Kit. ex Willd. — Shrub, up to 80 cm high, twigs erect or ascendent, hirsute. **Seeds ovoid, lateral flattish, apex rounded, base truncate, arillate, 2.4-2.8 x 1.8-2 mm. Surface smooth, lustrous, sandy- to olive-brown, aril white-yellowish. 2n = (48), 50.** Native to central Europe and the Balkan Peninsula, on stony and shrubby slopes, woodland steppes of warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

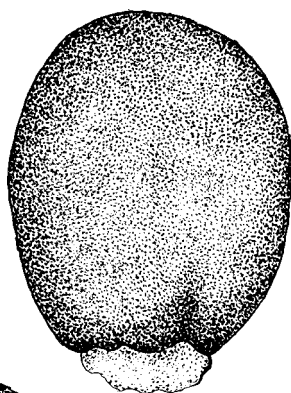
**1517. *Chamaecytisus austriacus*** (L.) Link, *Cytisus austriacus* L. — Shrub, up to 70 cm high, twigs erect or ascendent, hirsute. **Seeds spheroid to ovoid, slight flattish, base truncate, arillate, 2.6-3.4 x 1.8-2.3 mm. Surface strong lustrous, glabrous, olive-green to rusty-brown. 2n = (48), 96, 100.** Native to central Europe and the Balkan Peninsula, on stony and grassy slopes, pastures, vineyards of warmer areas, Hu, Mo, Ro, Sk, Uk.

**1518. *Chamaecytisus falcatus*** Waldst. et Kit. hybrid (*C. leucotrichus* x *ciliatus*) — Shrub, up to 30-40 cm high, stems erect, hirsute. **Seeds ± roundish, lateral compressed, with a small aril on the hilum, 2.9-3.1 x 2.4-2.6 mm. Surface glabrous, glossy, reddish-brown.** Native the eastern Balkan mountains, on stony calcareous slopes. Ro.

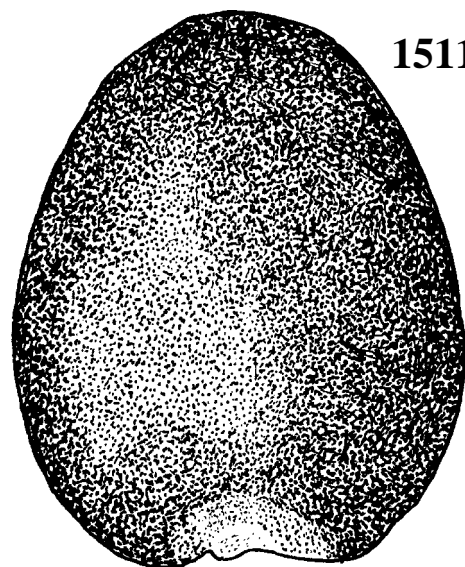
**1519. *Chamaecytisus glaber*** (L.) fil., *Cytisus elongatus* Waldst. et Kit. ex Willd. — Shrub, up to 1-1.5 m high, twigs erect or arcuate, slender. **Seeds ovoid or globular, lateral compressed, apex rounded, base ± truncate, arillate, 2.4-2.8 x 1.9-2.2 mm. Surface glossy, smooth, chocolate-brown.** Native to



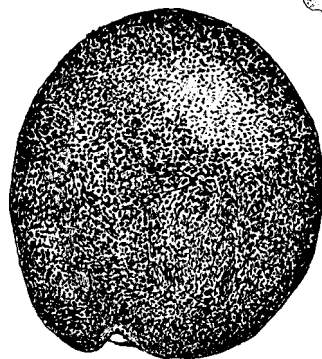
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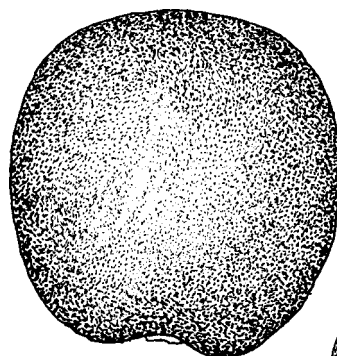
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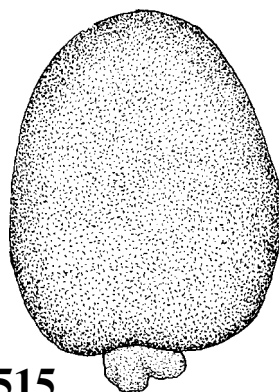
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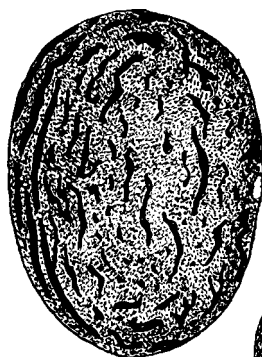
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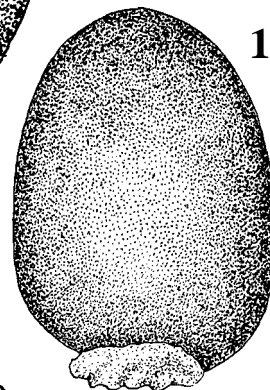
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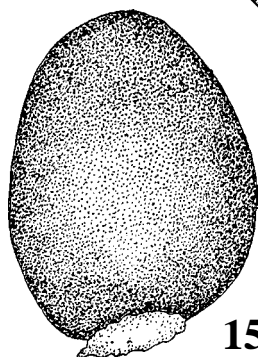
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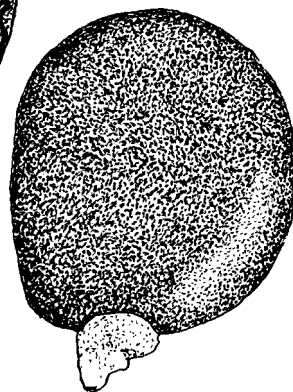
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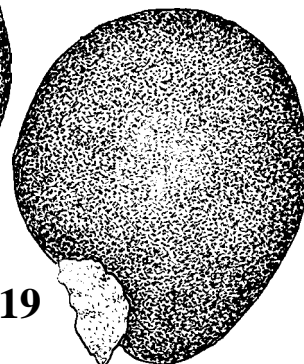
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1518



1519

South Carpathians and the Balkan Peninsula, on stony slopes, forest margins, shrubberies, calcicole. Ro, Uk.

**1520. *Chamaecytisus hirsutus* L., *Cytisus hirsutus* L.** — Shrub, up to 30-100 cm high, stems erect or ascendent, hirsute. **Seeds elliptic, flattish, apex rounded, base truncate, arillate, 3.5-4 x 2.2-2.6 mm. Surface smooth, high lustrous, yellowish-brown.** Native to central and southern Europe and Asia Minor, in hillsides and open woodlands, roadsides, lowland and downs. Ro, Uk.

**1521. *Chamaecytisus leucotrichus* (Schur) Forisier, *Cytisus leucotrichus* Schur** — Shrub, up to 100 cm high, trunk procumbent, twigs erect or ascendent. **Seeds ellipsoid to ovoid, flattish, apex rounded, base arillate, 3-3.5 x 2.5-2.8 mm. Surface smooth, lustrous, olive-yellow. 2n = 50.** Native to central and southern Europe, on sunny, stony and bushy slopes, forest steppes, in non-calcareous soils. Hu, Ro, Sk, Uk.

**1522. *Chamaecytisus lindemannii* V. Krecz., *Ch. elongatus* Lindem., *Cytisus lindemannii* V. Krecz.** — Shrub, 30-60 cm high, twigs erect, rough, bare-below, dense hirsute above. **Seeds ± spherical, roundish above, lateral compressed, ± truncate below, with whitish hilum, 2.8-3.2 x 2.8-3.2 mm. Surface glabrous, slight lustrous, yellowish-green.** Native to southeastern Europe, on steppe slopes, oak forests. Mo, Ro, Uk.

**1523. *Chamaecytisus podolicus* Blocki, *Cytisus capitatus* Bess.** — Shrub, 30-50 cm high, erect, twigs rough and hirsute. **Seeds ellipsoid, lateral compressed, apex rounded, base arillate, 3.3-3.6 x 2.4-2.6 mm. Surface smooth, lustrous, yellowish or dark-brown.** Native to southeastern Europe (the Ukraine), on dry calcareous slopes. Mo, Pl, Uk.

**1524. *Chamaecytisus purpureus* (Scop.) Link, *Genista purpurea* (Scop.) Scheele** — Shrub, up to 50 cm high, twigs procumbent or ascendent, armless, almost hairless. **Seeds elliptic to globular, flattish, apex rounded, base arillate, 3-3.6 x 2.3-2.7 mm. Surface glabrous, lustrous, dark-brown. 2n = 48.** Native to southwestern Europe, in shrubberies, rocky slopes, in calcareous soils; in the Carpathians rarely cultivated in rock-gardens in some forms.

**1525. *Chamaecytisus ratibonensis* (Schaeff.) Rothm., *Cytisus ratibonensis* Schaeff.** — Shrub, up to 50 cm high, with turning twigs, procumbent

or ascendent, hirsute. **Seeds ellipsoid to globular or ovoid, flattish, apex rounded, base arillate, 2.5-3 x 2.2-2.5 mm. Surface high lustrous, smooth, chocolate-brown. 2n = 50.** Native to the Euro-Siberian territory, in light, dryer forests and shrubberies, at forest margins and grassy, dryer slopes; throughout the Carpathians.

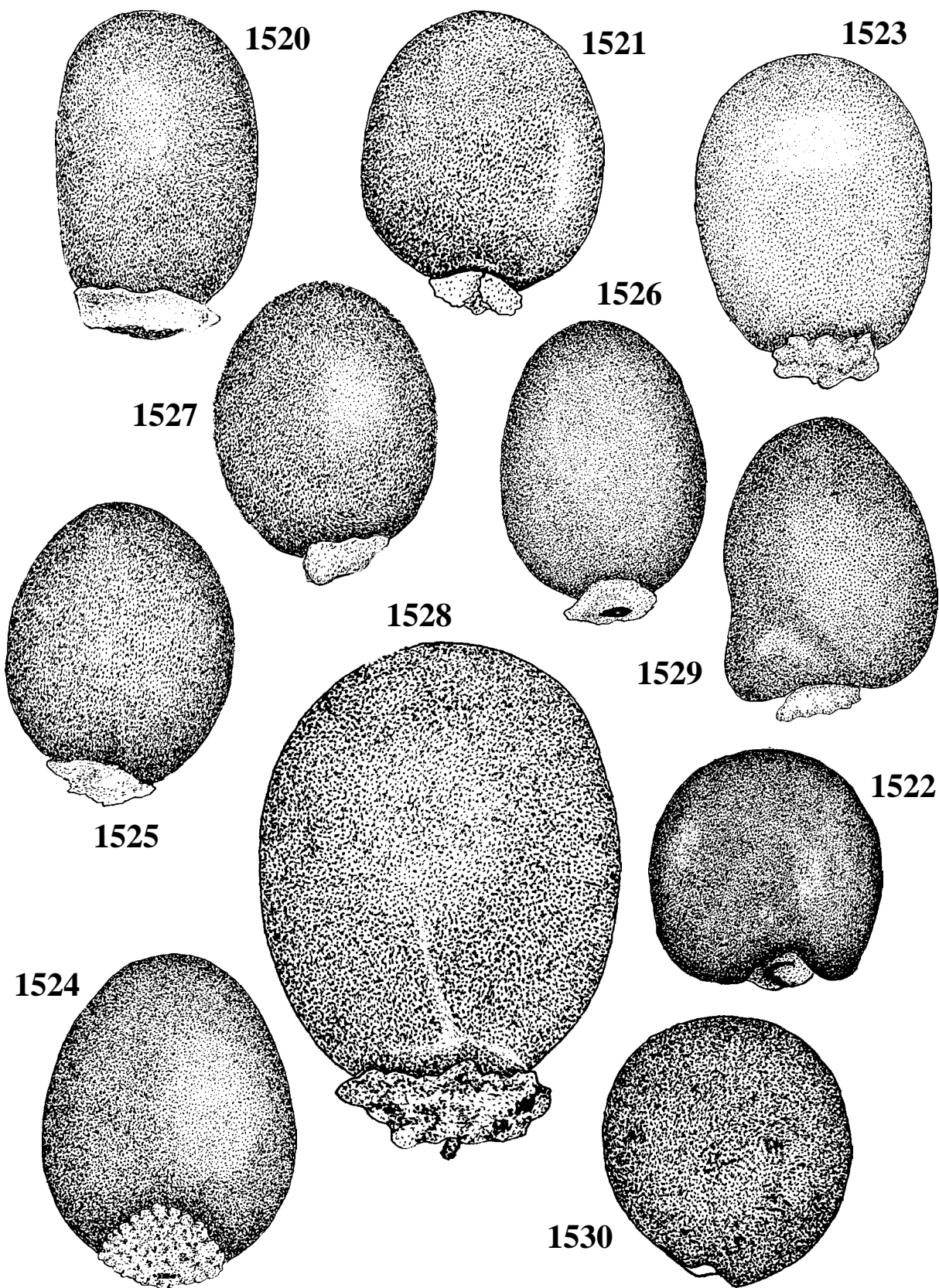
**1526. *Chamaecytisus rochelii* (Wierzb.) Rothm., *Cytisus rochelii* Wierzb.** — Shrub, up to 50-100 cm high, branches erect, with patent or semipatent hairs. **Seeds ovoid or ellipsoid, slight compressed, base with caruncle, 3.2-3.8 x 2.3-2.7 mm. Surface smooth, lustrous, pale to chocolate-brown.** Native to southern Europe, from Bulgaria to the Ukraine. Mo, Ro, Uk.

**1527. *Chamaecytisus ruthenicus* (Fisch. ex Woloszcz.) Klásková, *Cytisus pilosus* Pall.** — Shrub, 60-200 cm high, twigs erect or ascendent, bark greyish-brown or grey. **Seeds ± ovoid, lateral flattish, roundish above, arillate below, 3.2-3.6 x 2.4-2.8 mm. Surface glabrous, lustrous, pale- to dark-brown.** Native to the Ukraine and Belarus, on steppes and stony-steppe mountain slopes. Br, Mo, Pl, Uk.

**1528. *Chamaecytisus supinus* (L.) Link, *Cytisus supinus* L., *C. capitatus* Scop.** — Shrub, up to 100 cm high, twigs erect or ascendent, hirsute. **Seeds ellipsoid, flattish, apex rounded, base arillate, 3-3.5 x 2-2.5 mm. Surface high lustrous, smooth, greyish-brown. 2n = 50, 100.** An Euro-west-Asian element; in the Carpathian light forests, pastures, shrubby dry and grassy slopes, on calcareous, stony and loamy soils, up to 1600 m elevation. Hu, Pl, Mo, Ro, Sk, Uk.

**1529. *Chamaecytisus triflorus* (Lam.) Skalický, *Ch. hirsutus* (L.) Link** — Shrub, up to 200 cm high, twigs erect or ascendent, sparsely hirsute. **Seeds ellipsoid to ovoid, flattish, apex rounded, base arillate, 2.3-3 x 1.8-2.2 mm. Surface smooth, lustrous, yellowish-brown. 2n = 100.** Native to the Carpathians and Pannonia, in sunny shrubby slopes, rocky and stony places, Hu, Pl, Ro, Sk.

**1530. *Genista elata* (Moench) Wend., *G. tinctoria* L. var. *elata* (Moench) Aschers. et Graebn.** — Shrub, 50-150 cm high, legume up to 1.5 cm long. **Seeds roundish, lateral slight compressed, 1.9-2.1 x 1.7-1.9 mm. Surface smooth, lustrous, violet- or greenish-brown.** Native to western Europe;





overgrown shrubberies and mountain meadows, rare. Hu, Uk.

**1531. *Genista germanica* L., *Voglera germanica* (L.) Fourr.** — Shrub, up to 60 cm high, twigs erect, hirsute, thorny in armpit. **Seeds elliptic to ovoid, apex rounded, base truncate, radicular lobe mostly as long as the cotyledonary one or a little shorter, without strophiole, 1.6-2.2 x 1.4-1.8 mm. Surface high glossy, smooth, olive nut-brown to dark-purple. 2n = 42.** Native to Europe and western Asia, in light dry woodlands, roadside verges, prefers warm sites and calcifugous soils; in all Carpathian territories.

**1532. *Genista januensis* Viv., *G. triangularis* Kit.** — Semishrub, up to 1 m high, richly branched, twigs creeping or ascending, glabrous. **Seeds ovoid, lateral compressed, hilum roundish, 2.3-2.5 x 1.7-1.9 mm. Surface glabrous, glossy, greenish or reddish-brown.** Native to the Alps and the Balkan Peninsula, on sunny, stony, rocky screes, shrubberies, on calcareous stands. Ro.

**1533. *Genista ovata* Waldst. et Kit., *G. transsylvanica* Schur** — Semishrub, up to 200 cm high, erect or ascending, branched. **Seeds mitaform (length : width = 3 : 2) to elliptic, flattish, apex rounded, base truncate, primary groove indistinct, 2-2.6 x 1.8-2.1 mm. Surface high glossy, smooth, olive to blackish-brown. 2n = 48.** Native to Pannonia and the Balkan Peninsula, on sunny stony slopes, light forests and their margins. Hu, Ro, Sk.

**1534. *Genista pilosa* L., *Cytisus pilosus* Vis.** — Shrub, up to 150 cm high, twigs procumbent or ascendent, hirsute. **Seeds mitaform to elliptic, flattish, radicular lobe as long as the cotyledonary one, 2-2.5 x 2-2.3 mm. Surface high glossy, smooth, olive brown to dark vine-red. 2n = 24.** Native to Eurasia, in moderate zone, on heaths, woodland edges, clearings, roadside verges, semi-dry turfs. Au, Hu, Pl, Ro, Sk, Uk.

**1535. *Genista radiata* Scop., *Cytisanthus radiatus* (L.) O. F. Lang** — Semishrub, up to 100 cm high, ramified, with opposite or verticillate twigs. **Seeds mitaform to elliptic or ovoid, flattish, with indistinct or distinct primary groove, 3-3.5 x 2.3-2.7 mm. Surface high glossy, glabrous, olive to blackish-brown.** Native to central and southern mountains of Europe, mostly in communities on dry calcareous grounds. Ro.

**1536. *Genista sessilifolia* DC., *G. trifoliata* Janka, *G. romanica* (Prod.) Prod.** — Semishrub, up to 50 cm high, twigs oblong and silky pubescent. **Seeds ± ellipsoid, lateral compressed, radicle longer than cotyledons, 3.3-3.7 x 2.3-2.5 mm. Surface glabrous, lustrous, greenish-brown.** Native to the eastern part of the Balkan Peninsula, on grassy steep slopes with calcareous soils. Ro.

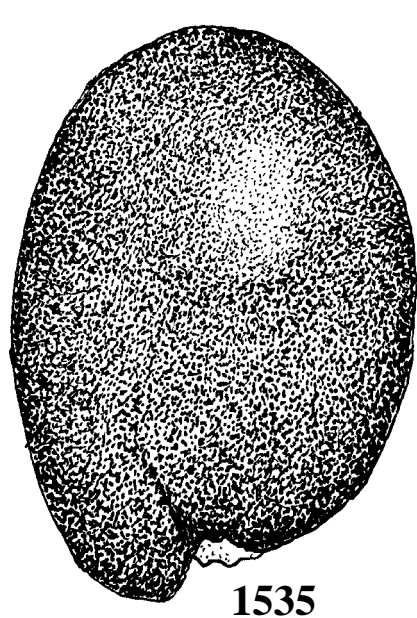
**1537. *Genista tinctoria* L. subsp. *eutinctoria* Domin** — Shrub or semishrub, up to 70 cm high, twigs erect or ascending, green, angular, glabrous or hirsute. **Seeds mitaform to elliptic, flattish, radicular lobe usually longer than the cotyledonary one, 2.5-3 x 1.8-2.3 mm. Surface smooth, high lustrous, red to reddish-brown. 2n = 48.** Native to most of Europe, in verges, dry turfs, heaths, light woodlands, mostly in loamy soils; throughout the Carpathians.

**1538. *Genistella sagittalis* (L.) Gams, *Genista sagittalis* L.** — Perennial (shrub), up to 50 cm high, tufted, stems procumbent, woody, flowering stems erect, simple or little branched. **Seeds mitaform to elliptic, flattish, apex rounded, base without strophiole, radicular lobe as long as the cotyledonary one, 1.8-2.2 x 1.6-1.8 mm. Surface high lustrous, smooth, yellowish- to greenish-brown. 2n = 44 (42, 46, 48).** Native to lowlands and downs of southern Europe, on semidry turfs, sloping-meadows, light dry woodland habitats, cultivated in rock-gardens. Hu, Mo, Pl, Ro, Sk, Uk.

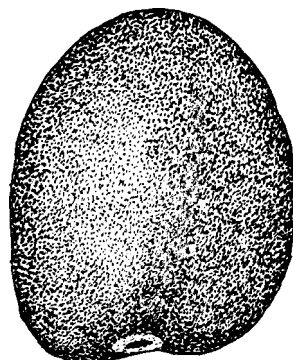
**1539. *Chamaespartium sagittale* (L.) P. E. Gibbs, *Cytisus sagittalis* (L.) W. D. J. Koch** — Semishrub, up to 15-30 cm high, stems creeping and ascending, simple or branched at the base, glabrous. **Seeds roundish, lateral compressed, 2-2.3 x 1.9-2.1 mm. Surface glabrous, glossy, yellowish or pale-brown. 2n = 48.** Native to central Europe, in oak woods, mountain meadows, on calcite grounds in submontane and montane zones. Hu, Pl, Ro, Sk, Uk.

**1540. *Lupinus albus* L.** — Annual, up to 120 cm high, stems branched above, shortly hirsute. **Seeds mitaform to elliptic, flattish, transverse section broad elliptic, hilum ascendent on the bottom side, 8-10 x 7-8 mm. Surface smooth, dull, mostly creamy-white, unspotted. 2n = (30, 40), 50.** Native to southern Europe; elsewhere often cultivated in gardens as ornamental, in fields for fodder or seeds production.

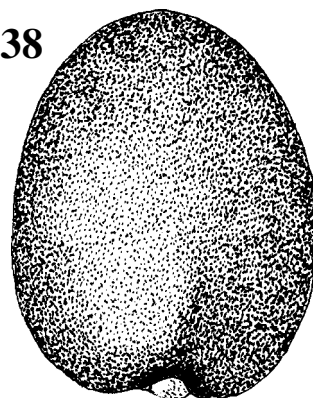




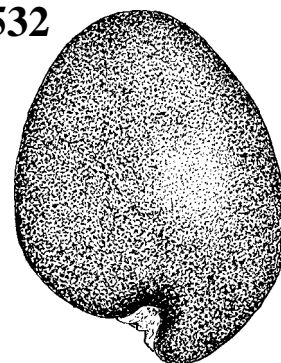
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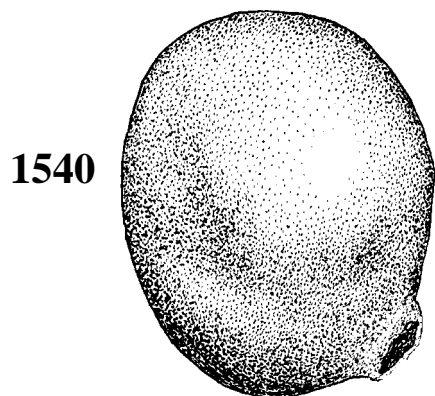
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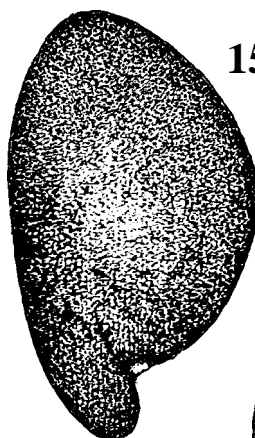
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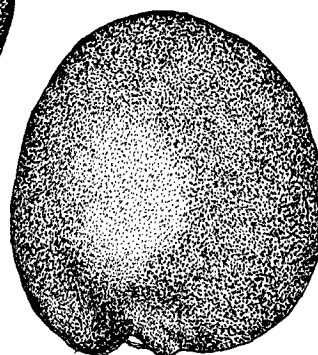
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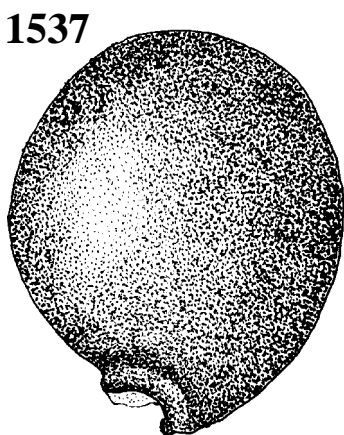
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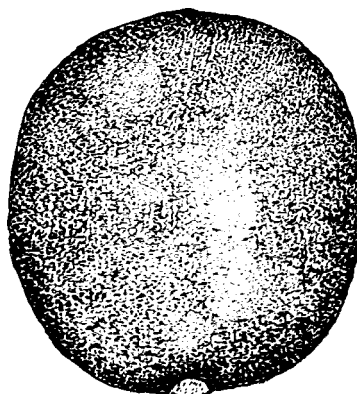
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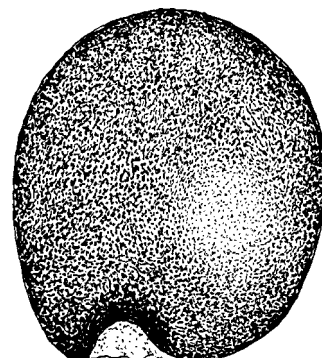
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**1541. *Lupinus angustifolius* L.** — Shrub, up to 100 cm high, stem ramified above, shortly hirsute. **Seeds elliptic, reniform or globular, transverse section circular or slight elliptic, 7-9 x 6-7 mm. Surface smooth, lustreless, motley, in general view greyish, spotted, hilum and chalaza area unspotted.  $2n = 40$  (48).** Native to the Mediterranean; rarely cultivated in gardens as ornamental, on fields as green manure and fodder crop, prefers acid soils; in all Carpathian territories.

**1542. *Lupinus luteus* L.** — Annual, up to 80 cm high, hirsute, stems erect, poorly branched. **Seeds broad elliptic, slight flattish, transverse section elliptic, hilum ascendent at the bottom, 6.5-8 x 5.5-6.5 mm. Surface dull, lustreless, pale-yellow, dense spotted to mottled black, spots missing from the curved line around hilum area.  $2n = 52$  (46, 48, 50).** Native to most of Europe; cultivated as fodder and green manure crop, sometimes naturalized.

**1543. *Lupinus mutabilis* Sweet** — Annual, stems 100-200 cm high, stems coarse, ramified, bare, leaves with 7-9 leaflets. **Seeds spherical, slight compressed, 8.5-10.5 x 7-8 mm. Surface glabrous, slight lustrous, whitish or spotted in dark-brown colour.  $2n = 42, 48$ .** Native to South America, in montane zone; in the Carpathians cultivated in gardens as ornamental in differently coloured cvs.

**1544. *Lupinus perennis* L.** — Perennial, up to 70 cm high, stem rough, glabrous or downy. **Seeds elliptic to obovoid, slight flattish, apex rounded, base truncate, 4.5-5.5 x 3-3.5 mm. Surface smooth, lustrous, greyish or brownish, dense spotted black, usually pale around hilum.  $2n = 48, 96$ .** Originally growing in North America; in the Carpathians often cultivated as ornamental, seldom naturalized at forest margins, used as fodder for beast.

**1545. *Lupinus polyphyllus* Lindl.** — Perennial, up to 150 cm high, pubescent, often unramified. **Seeds ellipsoid, slight flattish, 4.2-5 x 3-3.5 mm. Surface lustrous, pale-brown, very dense spotted-marbled, dark-brown, hilum and chalaza area usually unspotted.  $2n = 48$ .** Originally growing in North America; in the Carpathians commonly cultivated in gardens, at forest margins (fodder for beast) and fields (green manure crop.)

**1546. *Lupinus varius* L. subsp. *varius*** — Annual, stems up to 50 cm, scarcely ramified, covered with

silverish glossy hairs. **Seeds spherical, reniform or blunt rhomboidal, lateral compressed, ventral side with ellipsoid hilum, dorsal convex, 7-8 x 6.2-7 mm. Surface rough waved, lustrous, bases yellow, motley, brown and black-spotted.** Native to the Iberian and Balearic Peninsulas; in the Carpathians often cultivated in gardens as ornamental, seeds are used as fodder and raw material for coffee production.

**1547. *Lupinus varius* L. subsp. *orientalis* Franco et P. Silva, *L. digitatus* Forskål, *L. pilosus* L.** — Annual, up to 70 cm high, stems and calyx hirsute and leaflets softly villous, the hairs white. **Seeds  $\pm$  spherical or angular, lateral flattish and deflexed, hilum ellipsoid, 10-12 x 11-13 mm. Surface dense foveolate, lustrous, whitish-yellow, with a large blackish spot and some small brown spots.** Native to Syria and Egypt; in the Carpathians rarely cultivated as an ornamental.

**1548. *Robinia hispida* L., *R. hispida-rosea* Loisel.** — Shrub, up to 3 m high, ramified from the base. **Seeds prolonged ellipsoid with an ascending radicular lobe, hilum lanced, 5.2-5.8 x 3.2-3.6 mm. Surface slight lustrous, smooth, brown with dark-brown spots or wholly black.  $2n = 30$ .** Originally growing in North America; in the Carpathians rarely cultivated in parks and town verdure.

**1549. *Robinia neomexicana* A. Gray, *R. luxuriana* C. K. Schneid.** — Shrub or tree, up to 3 m high, bark brown. **Seeds ellipsoid with an ascending radicular lobe, hilum persistent laced, 5-5.5 x 3-3.5 mm. Surface smooth dull or weakly lustrous, black.** Originally growing in North America and Mexico; in the Carpathians sporadically cultivated as an ornamental in parks and orchards.

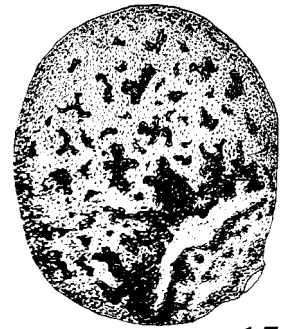
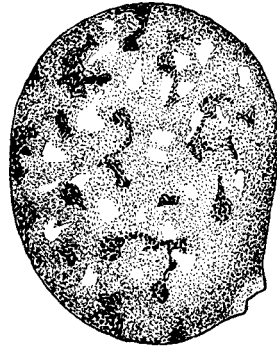
**1550. *Robinia pseudoacacia* L., *R. acacia* L.** — Tree, up to 25 m high, deciduous, twigs spreading. **Seeds irregular elliptic or reniform, lateral flattish, hilum with foniculus, 4.3-5 x 2.8-3.2 mm. Surface smooth, slight lustrous, chocolate-brown with black spots.  $2n = 20, 22$ .** Originally growing in North America; in the Carpathians naturalized in woodlands, planted as a street tree for ornament and for stabilizing soil, a good honey plant.

**1551. *Robinia viscosa* Vent., *R. glutinosa* Sims.** — Shrub or tree, up to 12 m high, twigs glandular, corona globular. **Seeds prolonged ellipsoid with curved bottom, lateral flattish, apex**



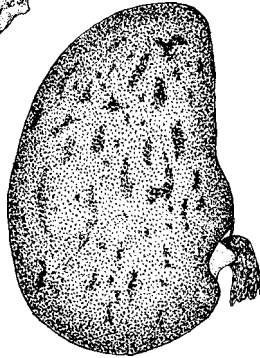
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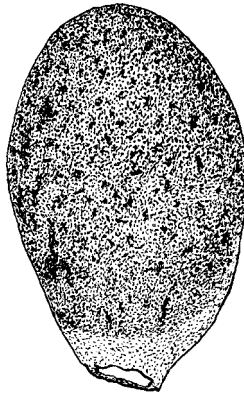


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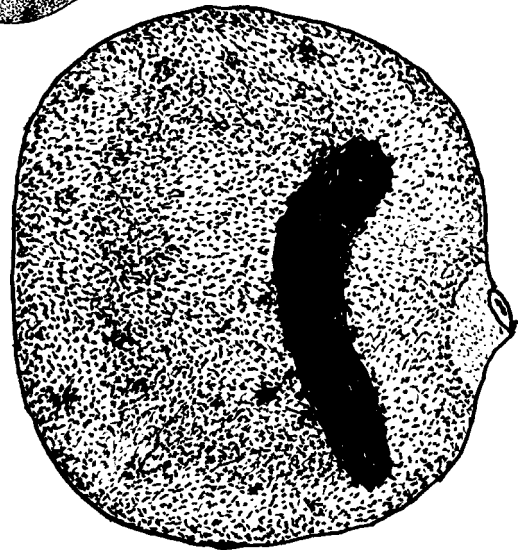
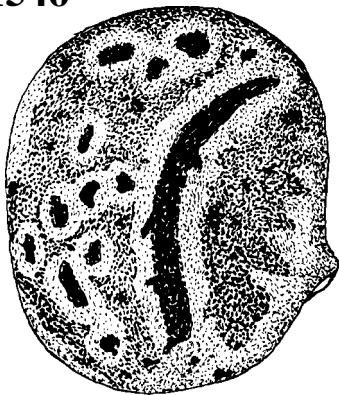
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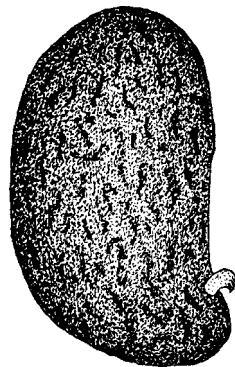


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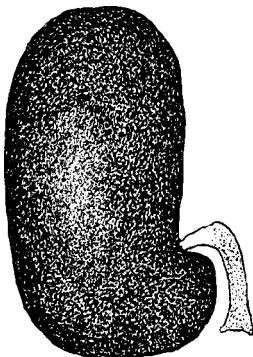
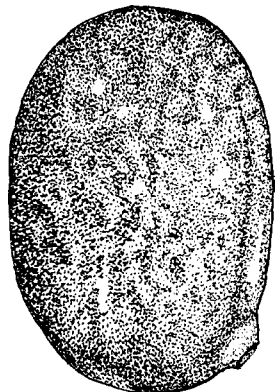


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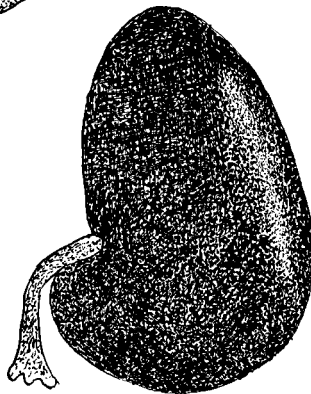
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1551



1548



1549

rounded, 4.5-5.2 x 2.7-3.2 mm. Surface smooth, slight lustrous, chocolate-brown, black-spotted or wholly black.  $2n = 20$ . Native to North America; in the Carpathians often planted in parks, town verdure and gardens.

**1552. *Wisteria floribunda*** DC., *W. multijuga* Van Houtte – Liana, up to 8 m high. **Seeds circular or elliptic, very strong flattish, 8-16 x 7-15 mm. Surface smooth, lustrous, brown to dark-brown, with black spots.  $2n = 16$ .** Originally growing in Japan, introduced into Europe; in the Carpathians rarely cultivated in parks.

**1553. *Wisteria frutescens*** Poir. – Liana, up to 12 m high. **Seeds ellipsoid very strong flattish, with indistinct keel all around the seed, 10-13 x 10-12 mm. Surface faint pitted, slight lustrous, dark-brown.  $2n = 16, 48$ .** Originally growing in North America; in the Carpathians rarely cultivated in parks.

**1554. *Wisteria sinensis*** (Sims) Sweet, *Glycine chinensis* Sims – Liana, up to 15 m high. **Seeds circular to reniform, with rounded apex and narrowed bottom, strong flattish, narrow keel all around seed, 12-15 x 10-12 mm. Surface smooth, slight lustrous, dark-brown, with darker spots.  $2n = 16$ .** Originally spread from eastern Asia; introduced into the Carpathians and cultivated near walls and chatter-houses, locally naturalized.

**1555. *Galega officinalis*** L. – Perennial, bare, up to 150 cm high, stems erect,  $\pm$  unbranched. **Seeds reniform to elliptic, slight compressed, apex and bottom rounded, hilum round or elliptic, 3.5-4.5 x 1.8-2.2 mm. Surface glabrous, faint tuberculate, dull or slight lustrous, olive-green to rusty-brown, hilum white-hem.  $2n = 16$ .** Native to southeastern Europe, in moist forests, meadows and shrubberies; rarely cultivated as a medical or an ornamental, naturalized throughout the Carpathians.

**1556. *Galega orientalis*** Lam. – Perennial, up to 150 cm high, glabrous or sparsely pubescent. **Seeds reniform or ellipsoid, slight compressed, radicle shorter and smaller than the cotyledons, 3.3-3.9 x 1.9-2.2 mm. Surface glabrous, slight lustrous, faint tuberculate, yellowish- to reddish-brown.** Native in to the Caucasus; in the Carpathians rarely cultivated as fodder, locally naturalized.

**1557. *Colutea arborescens*** L., *C. hirsuta* Roth – Shrub, up to 6 m high, twigs richly branched, downy

when young. **Seeds asymmetric, reni- or cordiform, flattish with a depression in the middle, hilum rounded to obovoid, 3.7-4.3 x 3.3-3.7 mm. Surface smooth, dull, dark-brown to black.  $2n = 16$ .** Native to southern Europe, in central Europe cultivated only in parks and naturalized at shrubby, light, dry slopes and forest margins. Hu, Ro, Sk, Uk.

**1558. *Colutea cilicica*** Boiss. et Bal. – Shrub, 2.5-3 m high, similar to *C. arborescens*, but with shorter obovoidal leaves. **Seeds reniform, lateral flattish, slight concave, dorsal side roundish, ventral with a whitish hilum, 3.8-4.2 x 3.4-3.6 mm. Surface glabrous, sparse pitted, blackish-brown, slight lustrous.** Native to southeastern Europe and Asia Minor, on mountain slopes; in the Carpathians rarely cultivated in parks. Uk.

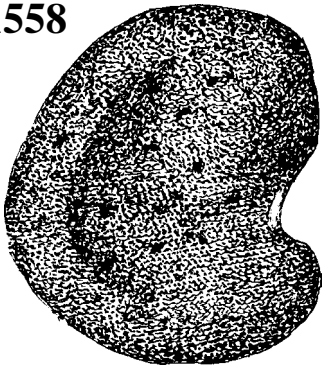
**1559. *Colutea orientalis*** Mill., *C. cruenta* Ait. – Shrub, up to 3 m high, young shoots slender, glabrous. **Seeds of irregular shape, rounded to triangular, flattish, slight depressed on sides, 3-4 x 3-3.5 mm. Surface smooth, dull, lustreless, greyish-brown.  $2n = 16$ .** Native to the Caucasus; in the Carpathians seldom cultivated in parks and gardens, occasionally naturalized.

**1560. *Halimodendron halodendron*** (Pall.) Voss, *Robinia halodendron* Pall. – Shrub, up to 2 m high, annual sprouts hirsute, glabrous later on, spinose. **Seeds reniform to elliptic, lenticular, flattish, hilum sunken, rounded, 2.6-3.2 x 2-2.5 mm. Surface olive- to dark-brown, unicoloured or faint spotted, hilum white.** Native to central and southwestern Asia (Transcaucasia, Turkestan), on salt steppes and maritime sands; in the eastern Carpathians rarely cultivated in parks and gardens. Mo, Ro, Uk.

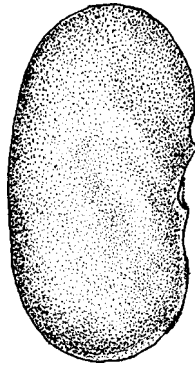
**1561. *Caragana arborescens*** Lam., *Robinia caragana* L. – Shrub or a small tree, 2-4 m high, young twigs hirsute. **Seeds broad reniform, ellipsoid to ovoid, apex and bottom rounded, 4-4.8 x 2.8-3.2 mm. Surface smooth, slight lustrous, reddish-brown to black.  $2n = 16$ .** Native to western Asia, on rocky slopes and along rivers; in all Carpathian regions commonly cultivated in parks and gardens as an ornamental in several cvs., uniquely naturalized.

**1562. *Caragana frutex*** (L.) K. Koch, *C. frutescens* (L.) DC. – Glabrous or pubescent dwarf shrub, up to 150 cm high. **Seeds elliptic to cylindric, radicular and the cotyledonary lobes unseparated, hilum**

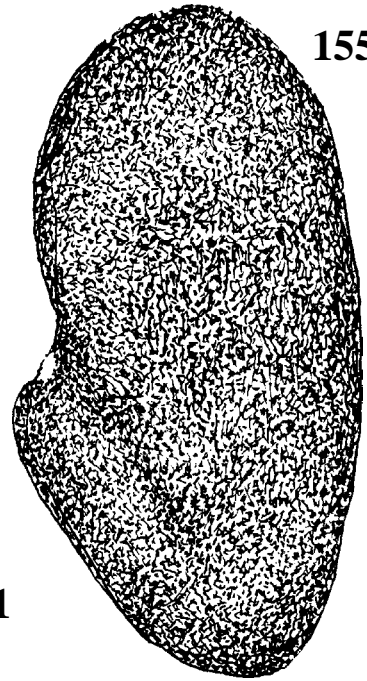
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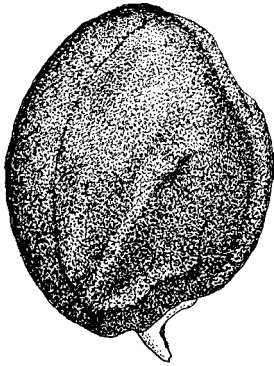
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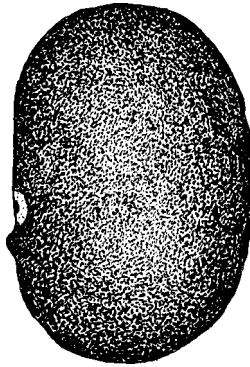
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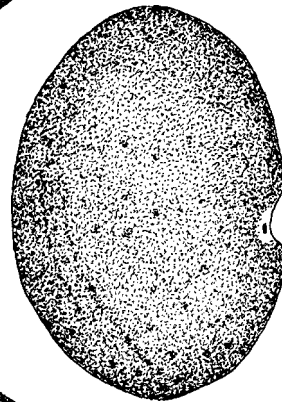
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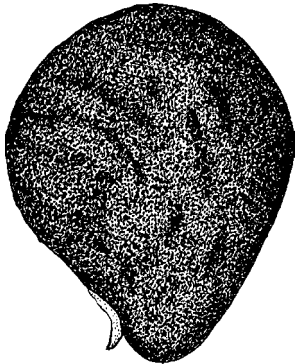
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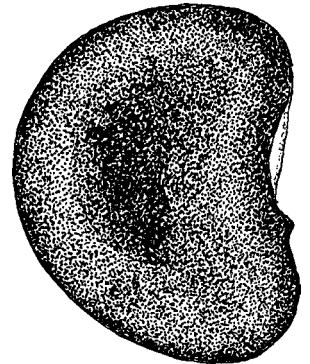
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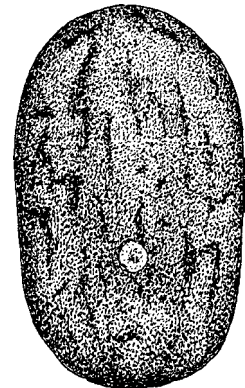
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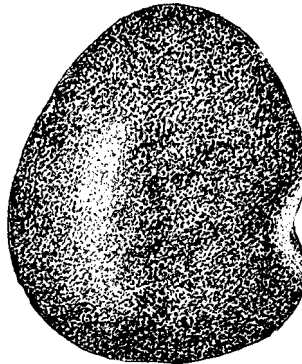
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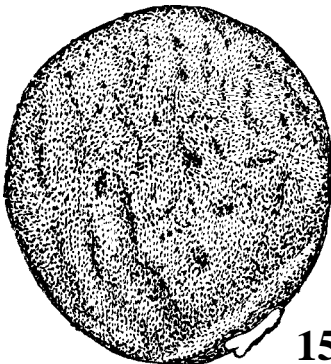
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1559



1552



circular at the middle or upper part of the long axis, 4-4.6 x 2.4-2.8 mm. Surface smooth, lustrous, reddish-brown with irregular dark-brown spots.  $2n = 32$ . Native to southeastern Europe to central Asia, in sunny dry places; in the Carpathians rarely cultivated in parks. Hu, Mo, Pl, Ro, Sk, Uk.

**1563. *Astragalus alpinus* L., *Phaca astragalina* L.** – Perennial, stems 10-30 cm long, slender, procumbent or ascendent. Seeds asymmetrical, reni- or cordiform, flattish, hilum rounded, sunken, 2.4-2.8 x 1.7-2 mm. Surface smooth, slight lustrous, greenish-yellow, pure or violet-spotted.  $2n = 16, 32$ . An European arctic-alpine species, on humous, skeletal, calcareous soil, on river sandy banks and meadows, light leafy woods. Pl, Ro, Sk.

**1564. *Astragalus arenarius* L.** – Perennial, stems 15-30 cm high, woody, procumbent or ascendent, ramified, hirsute at base. Seeds ellipsoid to obovate or reniform, flattish, hilum sunken, rounded, 2.2-2.8 x 1.5-2 mm. Surface egg-yellow to orange-brown, sometimes moderate spotted purple-brown.  $2n = 16$ . Native to central Europe, as far as Sweden, in dry sandy places, rivers deposits, pine forest margins. Br, Pl, Mo, Ro, Uk.

**1565. *Astragalus asper* Wulfen ex Jacq., *A. chloranthus* Pall.** – Perennial, stems 20-60 cm high, stout, hirsute. Seeds rhomboidal, spheroidal, reniform, flattish, hilum more or less rounded with a bright hem, 1.6-2.2 x 1.2-1.4 mm. Surface smooth, dull or faint lustrous, sandy- to greyish-brown, sometimes brown-spotted.  $2n = 48$ . Native to eastern Europe, on dry meadows and shrubberies, calcareous rocks, screes and steppes. Hu, Mo, Ro, Sk, Uk.

**1566. *Astragalus australis* (L.) Lam., *Phaca australis* L.** – Perennial, stems up to 10-30 cm high, ascendent. Seeds asymmetrical cordiform or reniform, flattish, hilum rounded, with a persistent hilum string, 3-3.6 x 2.5-3 mm. Surface smooth, dull, faint tuberculate, reddish-brown, sometimes dark-spotted.  $2n = 32, 48$ . An Eurasian element of subalpine and alpine zones, on dry, sunny, calcareous stands, in leafy, shrubberies, sandy riverbanks and gypsum grounds.

**1567. *Astragalus austriacus* Jacq.** – Perennial, stems 10-60 cm high, slender, ascendent or erect, woody at base. Seeds prolonged cylindric, cordiform or reniform, flattish, 1.4-2.5 x 0.9-1.2 mm. Surface

smooth, lustrous, unicoloured olive-brown to black or tiny spotted.  $2n = 16$ . Native to Eurasia in lowland and upland zones, dry meadows, sunny slopes, shrubby and stony places, on basic substrates. Hu, Mo, Pl, Ro, Sk, Uk.

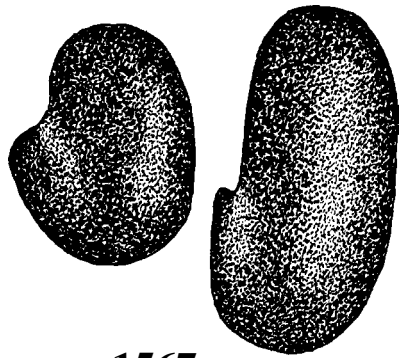
**1568. *Astragalus cicer* L.** – Perennial, stems up to 100 cm high, ascendent, up to suberect, ramified. Seeds cordi- or reniform, cylindric, flattish, 2.2-2.8 x 1.8-2.2 mm. Surface smooth, lustrous, yellow to pale-brown, unicoloured, rare indistinct spotted.  $2n = 64$ . Eurasian element wide-spreading from lowlands to downs, mostly in calcareous, grassy woody steppes, shrubberies, boundaries; throughout the Carpathians.

**1569. *Astragalus contortuplicatus* L.** – Annual, stems ascendent or erect, up to 50 cm high, poorly ramified. Seeds broad reniform, slight flattish, 1-1.2 x 0.8-1 mm. Surface smooth, lustrous, green-yellow, violet, seldom pale-brown.  $2n = 16$ . Native to eastcentral Europe, extending as far as Bulgaria and Russia, on moist, sandy, saline meadows, fields, roads. Hu, Mo, Ro, Uk.

**1570. *Astragalus danicus* Retz., *A. hypoglottis* auct. non (L.)** – Perennial, stems up to 30 cm, single, ascendent, poorly ramified. Seeds irregular cordiform to reniform, flattish, radicular lobe about 2/3 of the cotyledonary one, 1.4-2 x 1.3-1.6 mm. Surface uniform dark-brown to black, sometimes minute and copious spotted, smooth, dull or slight lustrous.  $2n = 16$ . Native to Eurasia, on sunny pastures, steppe meadows, in warmer areas. Br, Pl, Sk, Uk.

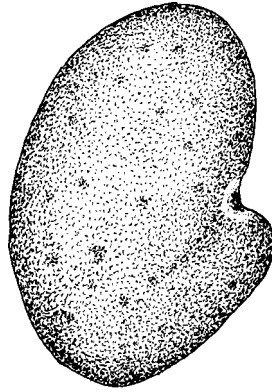
**1571. *Astragalus dasyanthus* Pall., *A. pannonicus* Schulz** – Perennial, tufted, stems 10-20 cm high, dense, erect, longly brown hirsute. Seeds elliptic to reniform, flattish, hilum sunken, rounded, with pale surrounding, 3.5-4 x 2.5-3 mm. Surface smooth, lustrous, olive- to pale-brown.  $2n = 16$ . Native to central Europe (Pontic-Pannonian lowland), on sunny shrubberies, sandy and stony substrates. Hu, Mo, Ro, Sk, Uk.

**1572. *Astragalus depressus* Torn.** – Perennial, stems up to 10 cm high, leafy, procumbent, inflorescence on a 1.5-3 cm long - stalk, with 6-14 flowers. Seeds reniform, lateral compressed, hilum rounded, sunken, with yellowish surroundings, 2.2-2.4 x 1.5-1.7 mm. Surface glabrous, slight lustrous, yellowish-brown.  $2n = 16$ . Native to Eurasia, in rocky, calcareous, sunny places of montane and subalpine zones. Ro.

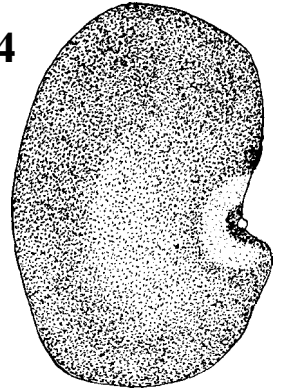


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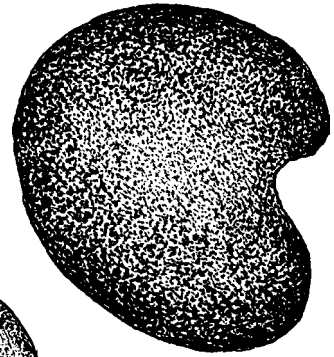
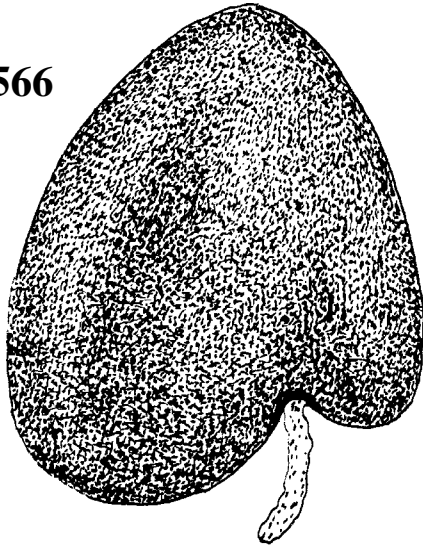
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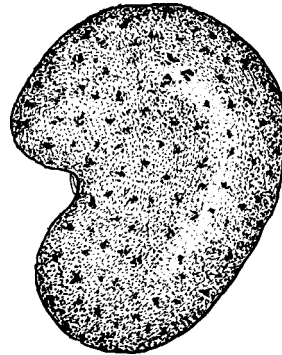
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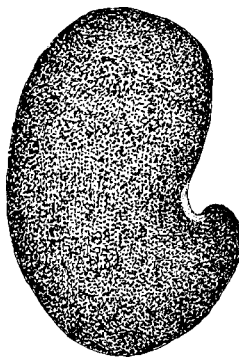
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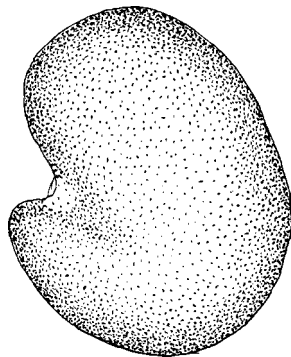
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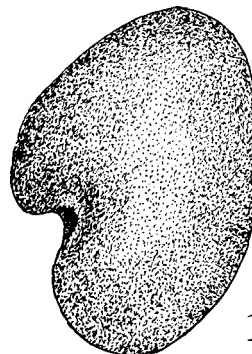
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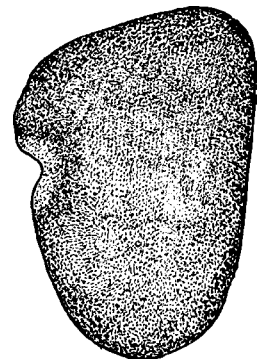
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1565



1572



**1573. *Astragalus excapus*** L. — Perennial, rhizome short, woody, stems very short, only some mm long. **Seeds broad reniform up to asymmetric cordiform, flattish, hilum sunken, rounded, white-brim, 3-3.6 x 2-2.5 mm. Surface smooth, weakly lustrous, reddish-brown to black, mostly unicoloured. 2n = 16.** Native to Eurasia, in montane and subalpine zones, on dryer, calcareous, sandy soils, meadows and woodlands. Hu, Mo, Ro, Sk, Uk.

**1574. *Astragalus falcatus*** Lam. — Perennial, stems erect, 50-80 cm high, slight angular, blackish and whitish hirsute. **Seeds reniform, compressed, hilum rounded-white with paler surroundings, 2.5-2.9 x 1.8-2 mm. Surface smooth, dull or slight lustrous, yellowish-brown.** Native to southeastern Eurasia, on shrubby steppes, meadows, in light leafy (oak) woods and their clearings and margins, sometimes introduced to and naturalized in the Carpathians. Ro.

**1575. *Astragalus frigidus*** (L.) A. Gray, *Phaca frigida* L. — Perennial, stems 15-20 cm, erect,  $\pm$  ramified, glabrous. **Seeds mitaform (length : width = 3 : 2), reniform, slight flattish, apex rounded, hilum sunken, rounded, white bordered, 3-3.4 x 2.2-2.6 mm. Surface smooth, nut-brown, dark-brown to black-brown. 2n = 16.** An Eurasian element, extending in subalpine and alpine zones, on moister, stony and rocky, especially calcareous substrates, shrubberies, woods, shady river and brook banks. Pl, Ro, Sk.

**1576. *Astragalus galegiformis*** L. — Perennial, stems erect, strong, 40-100 cm high, rarely ascendent, glabrous, furrowed. **Seeds reniform or ellipsoid, strong lateral compressed, hilum rounded with pale surroundings, 3.7-3.9 x 2.5-2.7 mm. Surface smooth, lustrous, greenish-brown to brown.** Native to Eurasia, in subalpine meadows, leafy forests, shrubberies, riverbanks. Ro (?), Uk.

**1577. *Astragalus glycyphylloides*** DC. — Perennial, stems ascendent, whitish shortly hirsute, furrowed, 60-80 cm. **Seeds reniform, lateral compressed, hilum distinct roundish with a white hem and pale surroundings, 2.7-3 x 2-2.2 mm. Surface smooth, lustrous, pale-brown.** Native to the Balkan Peninsula up to Asia Minor, in forests, rarely hauling into the Carpathians.

**1578. *Astragalus glycyphyllus*** L. — Perennial, bare, stems 30-150 cm long, procumbent up to creeping ascendent, angular, glabrous. **Seeds reniform or**

**asymmetric cordiform, flattish, hilum sunken, rounded with a narrow white hem, 2.5-2.8 x 1.8-2.2 mm. Surface egg-yellow to yellowish or pale-brown. 2n = 16.** Native to most of Europe, mainly in mountains in the south, in forests, shrubberies, embankments; throughout the Carpathians.

**1579. *Astragalus hamosus*** L. — Annual, stems procumbent, ascendent or erect, 20-60 cm high, pubescent. **Seeds quadratic, rectangular or reniform, flattish, hilum sunken, rounded, 2-2.5 x 1.8-2.2 mm. Surface smooth or tuberculate, olive to pale-brown, mostly minute spotted.** Native to Mediterranean region, southern Asia and western Africa, at maritime sandy coasts, road margins, steppes, dry stony mountain slopes. Ro, Uk.

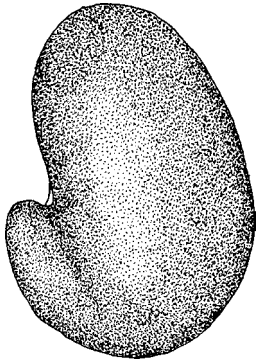
**1580. *Astragalus monspessulanus*** L. — Perennial, acaulescent, with branched stock, rich bunch of leaves and peduncles, 10-20 cm high. **Seeds prolonged elliptic or reniform, often rhombic, flattish, 2.8-3.2 x 2-2.2 mm. Surface glabrous, faint undulate, slight lustrous, olive- to dark-brown.** Native to southeastern Europe, in lowland to subalpine zones, on calcareous, warmer stands, dry meadows and rocky steppes. Mo, Ro, Uk.

**1581. *Astragalus norvegicus*** Weber, *A. oroboides* (DC.) Hornem. — Perennial, stems 20-40 cm, erect, stout, glabrous, scattered hirsute. **Seeds reniform, flattish, hilum sunken, rounded, with pale surroundings, 2-2.5 x 1.8-2.1 mm. Surface smooth, lustreless, olive to pale-brown, moderate minute spotted or without spots. 2n = 16.** Native to arctic Europe, spreading as far as the mountains of Fennoscandia, the Alps, the Carpathians and the Ural, on rocks, stony meadows, calcareous soils. Ro (?), Sk.

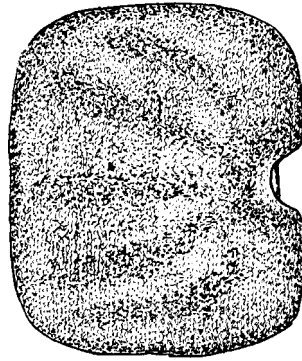
**1582. *Astragalus onobrychis*** L., *A. borysthenticus* Klokov — Perennial, stems up to 100 cm, woody at base, procumbent or ascendent, ramified. **Seeds ellipsoid, asymmetric cordiform or reniform up to rhombic, flattish, 2-2.5 x 1.2-1.6 mm. Surface smooth, lustrous, olive-brown to black, dense minute spotted. 2n = 64.** East-European and West-Asian element, in steppe places, slopes, sandy areas; throughout the Carpathians.

**1583. *Astragalus penduliflorus*** Lam., *Phaca alpina* auct. non Jacq.: G. Reuss, *P. penduliflora* (Lam.) Gams — Perennial, stems 20-50 cm high, stout, erect,  $\pm$  ramified, hirsute below. **Seeds reniform, flattish, radicular lobe c. half of the cotyledonary one, often**

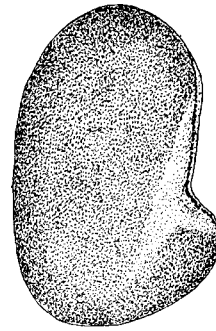




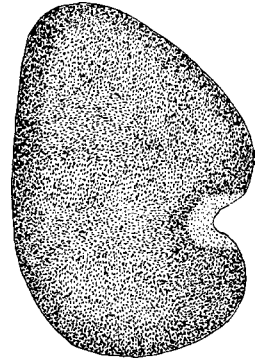
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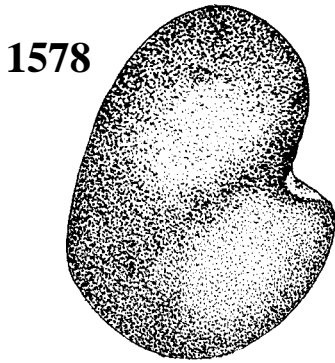
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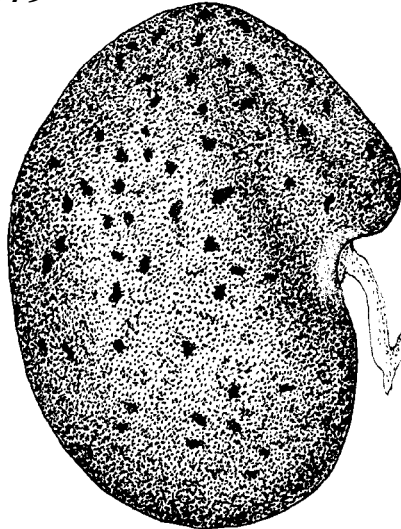
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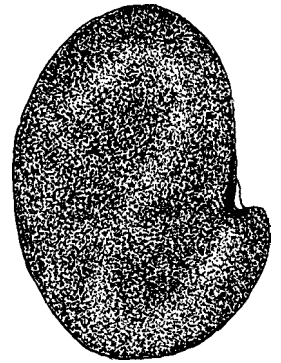
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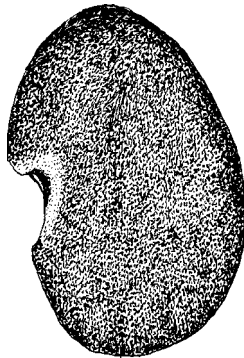
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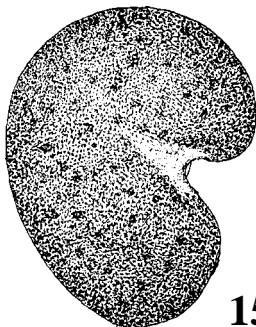
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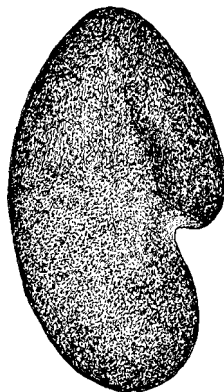
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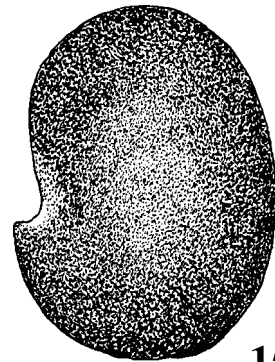
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1581



1580



1582

higher around hilum, 3-3.5 x 2.3-2.7 mm. Surface olive to dark-brown, sparsely spotted.  $2n = 16$ . Native to alpine and boreal zones of Eurasia, on dry, calcareous rocks. Pl, Ro, Sk.

**1584. *Astragalus péterfii*** Jáv. — Perennial, stems erect or suberect, leafy, up to 20 cm, woody at base, sparsely hairy. **Seeds rhomboidal, apex and base aslant, 2.3-2.7 x 1.8-2.1 mm. Surface smooth, lustrous, greyish-brown.  $2n = 64$ .** Native in to the central part of East Carpathians, on steppes and grassy hill-slopes, sunny loamy grounds. Ro.

**1585. *Astragalus ponticus*** Pall. — Perennial, stems erect, stout, up to 100 cm high, sparsely hairy. **Seeds broad elliptic to obovoid, flattish, 3-3.5 x 2.2-2.4 mm. Surface glabrous, lustreless, greenish-yellow to pale-brown.** Native to southeastern Europe, Asia Minor, on hills, forest clearings and at margins, road and riverbanks. Mo, Ro, Uk.

**1586. *Astragalus purpurescens*** Lam., *A. gremlii* Burnat — Perennial, stems 10-40 cm, slender, ascending, sometimes with some medifixed hairs, leaves 4-8 cm, leaflets 7-15 pairs. **Seeds ovoid or reniform, inflexed, lateral compressed, 2-2.3 x 1.9-2.1 mm. Surface glabrous, faint lustrous, dense scarlet-purplish spotted.** Native to western and southern Europe, up to the western part of the Balkan Peninsula, mainly in mountains; rarely hauling into the Carpathians.

**1587. *Astragalus roemerii*** Simk. — Perennial, stems ramified, 50-70 cm, stout, herbaceous, erect. **Seeds subellipsoid, compressed, apex slanting at one side, base rounded, 2.5-3 x 1.8-2.2 mm. Surface smooth, lustrous, yellowish-brown.** Native to the eastern Carpathians, at calcareous rocks and screes. Ro.

**1588. *Astragalus spruneri*** L., *A. leptostachys* Pall. — Perennial, basal part and short stems woody, length of peduncle with inflorescence equal to that of the leaves. **Seeds reniform, lateral compressed, dorsal side convex, ventral concave with rounded hilum, 2.8-3.2 x 2-2.4 mm. Surface coarse foveolate, slight lustrous, dark- to blackish-brown.** Native to that of the Balkan Peninsula, on arid foothills, rocky slopes with calcareous grounds. Ro.

**1589. *Astragalus subulatus*** Pall., *A. subuliformis* DC. — Perennial, semishrub 15-20 cm high, ramified, twigs cinnamon-brown. **Seeds prolonged semiellip-**

**tical or rhomboidal, lateral compressed, hilum little expressive, 2.6-3 x 1.2-1.4 mm. Surface smooth, slight undulated, high lustrous, yellowish-green, dense minute spotted.** Native to southeastern Europe, rare in rocky areas, mostly on loess. Mo, Ro, Uk.

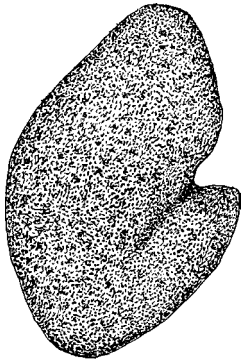
**1590. *Astragalus sulcatus*** L., *A. jacquinii* Janka — Perennial, stems erect, lateral stems ascendent, 30-80 cm high, leafy, adpressed hirsute. **Seeds prolonged or broad elliptic to reniform, flattish, mostly convex on sides, 1.2-1.8 x 0.8-1.2 mm. Surface glabrous, slight lustrous, olive, dark-to black-brown, dense spotted.  $2n = 16$ .** Native to European and Siberian mountains, on stony, calcareous, humous grounds. Hu, Ro, Uk.

**1591. *Astragalus vesicarius*** L., *A. albidus* Waldst. et Kit. — Perennial, stems up to 25 cm, erect or ascending, angular, simple or branched, hirsute. **Seeds asymmetrical, cordiform, rhomboidal, compressed, often convex on both sides, 2.6-3.2 x 1.6-2 mm. Surface glabrous or pitted, lustrous, olive, violet to dark-brown, dense spotted or uncoloured.  $2n = 16$ .** Native to southeastern and eastcentral Europe, on steppes, dry meadows, south-exposed slopes. Au, Hu, Ro, Sk, Uk.

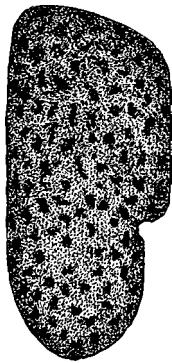
**1592. *Astragalus virgatus*** Pall., *A. varius* Gmel. — Perennial, stems erect or ascending, 20-80 cm high, base and twigs woody. **Seeds  $\pm$  reniform or subellipsoid, apex narrowed, rounded or slanting on one side, bottom truncate, lateral compressed, 2.3-2.7 x 1.3-1.5 mm. Surface glabrous, lustrous, yellowish-grey or grey, violet spotted.** Native to Balkan territories and southeastern Europe, on sandy dunes and soils; rarely. Hu, Mo, Ro, Uk.

**1593. *Oxytropis campestris*** (L.) DC., *O. tatrae* Borbás, *Astragalus campestris* L. — Perennial, acaulescent, peduncle c.10 cm high. **Seeds rounded, slight elliptic or reniform, flattish, 2-2.5 x 1.8-2.2 mm. Surface dull to lustrous, olive, nut-brown, old seeds red- to dark-brown, lightish around the hilum, often sparse spotted to mottled.  $2n = 48$ .** An Arctic-alpine species of Europe mountains, on dryer calcareous meadows and pastures, on rocks, screes. Uk.

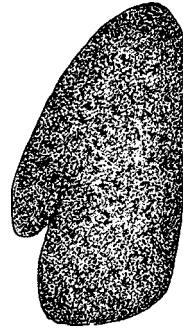
**1594. *Oxytropis carpatica*** Uechtr., *O. montana* var. *carpatica* (Uechtr.) Hausskn. — Perennial, stems without leaves, very short, 1-1.5 cm high, whole plant hirsute, leaves in a basal rosette. **Seeds  $\pm$**



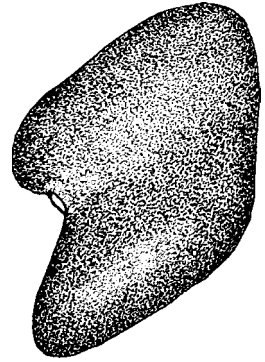
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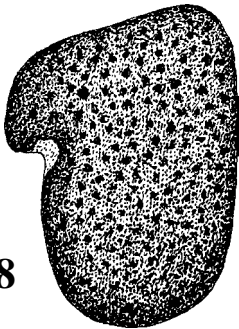
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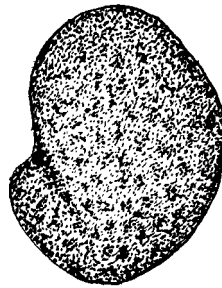
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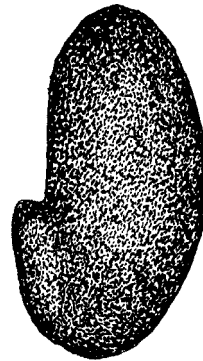
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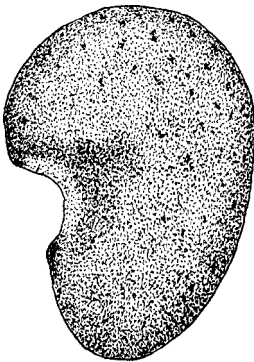
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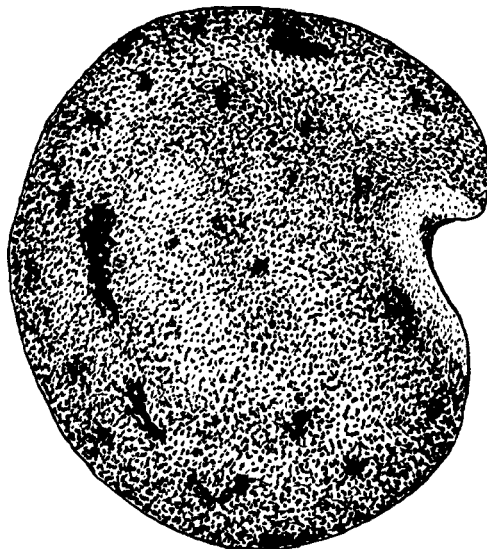
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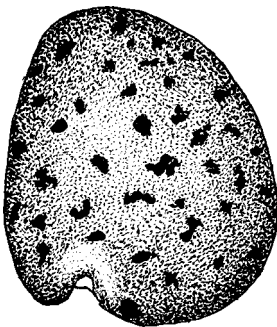
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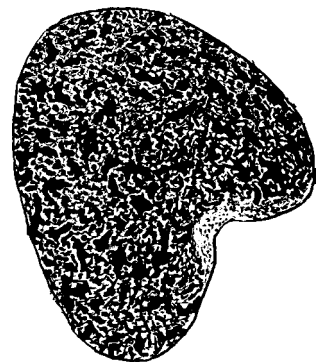
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1594



1586

broad ovoid, lateral compressed, apex narrowed, radicle and cotyledons mostly equal broad, 1.8-2.1 x 2-2.3 mm. Surface glabrous, slight lustrous, greyish-brown, without spots or dark-violet spotted. Carpathian endemic, on rocky, calcareous stands, mountain wet meadows, in the alpine zone. Pl, Ro, Sk, Uk.

**1595. *Oxytropis halleri*** Bunge ex W. D. J. Koch, *O. sericea* (DC.) Simonk. non Nutt. — Perennial, acaulescent, peduncles 5-30 cm, hirsute. **Seeds irregular reniform or cordiform, flattish, hilum sunken, lightish around the hilum, 2-2.5 x 1.8-2.1 mm. Surface smooth, lustrous, olive-green, sandy-brown up to rusty-brown, old seeds dark-brown. 2n = 16, 32.** Native to the mountains of central and southern Europe, on dryer soils and screes. Pl, Ro, Sk.

**1596. *Oxytropis pilosa*** (L.) DC., *Astragalus pilosus* L. — Perennial, stems 20-50 cm high,  $\pm$  erect, poorly branched, shaggy. **Seeds prolonged elliptic to reniform, flattish, radicular lobe 2/3 of the cotyledonary one, 1.2-1.8 x 1-1.4 mm. Surface smooth, lustrous, olive to grey nut-brown, old seeds red- to blackish brown. 2n = 16.** Native to eastern Europe and western Asia, on dry, calcareous, sandy soils; throughout the Carpathians.

**1597. *Glycyrrhiza echinata*** L. — Perennial, stems erect, up to 1-1.5 m high, glabrous, branches few or absent. **Seeds elliptic, very slight flattish, transversal section slight oval, 3.2-3.8 x 2.4-2.8 mm. Surface smooth, dull, greyish-brown.** Native to the eastern Mediterranean, southwestern and eastern Asia, on swampy and marshy grounds, edges of ditches; cultivated for liquorice. Hu, Mo, Ro, Uk.

**1598. *Glycyrrhiza glabra*** L., *G. glandulifera* Waldst. et Kit. — Perennial, pubescent erect, rough, branched, stems 50-150 cm. **Seeds prolonged elliptic, flattish, hilum sunken, rounded, 2.5-3 x 2-2.5 mm. Surface smooth, slight lustrous or dull, greyish green, brown, often faint spotted. 2n = 16.** Native to southeastern Europe and Asia Minor, in dry open habitats; in the part cultivated for sweet its rhizome as a source of liquorice, currently naturalized in some places. Hu, Mo, Ro, Uk.

**1599. *Glycyrrhiza macedonica*** Boiss. et Orph — Perennial, stems 80-150 cm high, inflorescence dense, prolonged, not spherical. **Seeds  $\pm$  obovoid, lateral compressed, dorsal side rounded, ventral  $\pm$  trun-**

**cate, 2.6-3 x 2.3-2.5 mm. Surface glabrous, lustreless, greyish-brown.** Native to southeastern Europe, on river overflowed areas, in dump woods, at river and brookbanks. Uk.

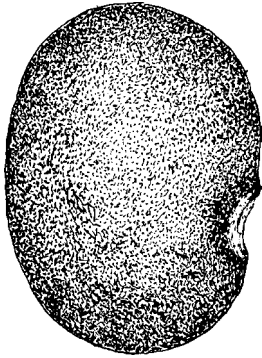
**1600. *Amorpha fruticosa*** L. — Shrub, up to 3 m high, flower racemes many-flowered, twigs slender, bark brown or greenish, hirsute. **Seeds prolonged ellipsoid, apex rounded, base curved and constricted, 3.6-4 x 1.4-1.6 mm. Surface smooth, dull to slight lustrous, reddish-brown. 2n = 40.** Native to North America; often planted as an ornamental in parks, gardens, hedgerows, town verdure, locally naturalized. Hu, Mo, Ro, Sk, Uk.

**1601. *Phaseolus aureus*** Roxb., *P. radiatus* L., *Vigna radiata* (L.) Wilczek — Annual, stems 50-80 cm high, erect, hardly hairy. **Seeds  $\pm$  ellipsoid, dorsal side longer than the ventral one, cubic, lateral faint compressed, 4.3-5 x 3.1-3.5 mm. Surface longitudinal and transversal faint ribbed, indistinct spotted, lustreless, greenish or greyish-brown.** Native to southeastern Asia, on fields; in the Carpathians rarely cultivated as a legume in warmer areas.

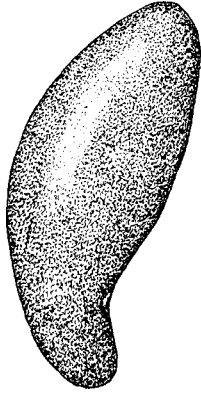
**1602. *Phaseolus coccineus*** L., *P. multiflorus* Willd. — Annual to perennial, hirsute, twining, 2-4 m high. **Seeds reniform, flattish, transverse section oval, 15-22 x 10-15 mm. Surface smooth, dull or slight lustrous, white, reddish-brown with black spots or bright-brown with dark-brown spots or black. 2n = 22.** Originally growing in tropical America; commonly cultivated in gardens, near fences for its edible seeds and as an ornamental, throughout the Carpathians.

**1603. *Phaseolus lunatus*** L. — Perennial, twining, up to 2 m high. **Seeds irregularly ellipsoid, flattish, 12-22 x 8-15 mm. Surface smooth, slight lustrous whitish-yellow with violet drawing, or unicoloured - reddish-brown, black or motley. 2n = 22.** Native to Central and South America; seldom cultivated in gardens as ornamental liana.

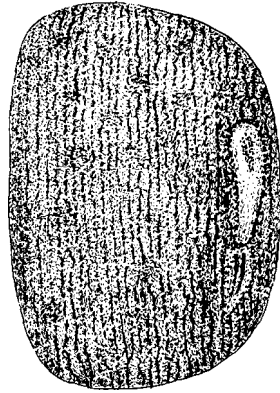
**1604. *Phaseolus vulgaris*** L., *P. nanus* L. — Annual, stems twining, 1-3 m long, or erect 30-100 cm. **Seeds reniform to ellipsoid, often flattish, transverse section to broad elliptic, 8-20 x 5-12 mm. The seeds differ with each cultivar. Surface smooth, lustrous to glossy, colour very variable. 2n = 22.** Native to



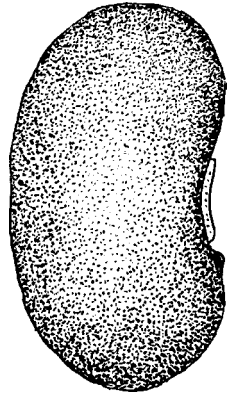
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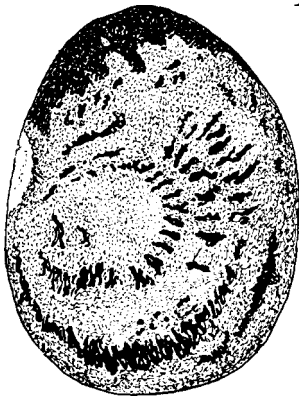
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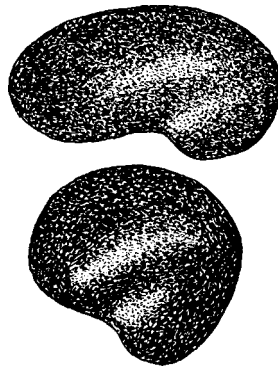
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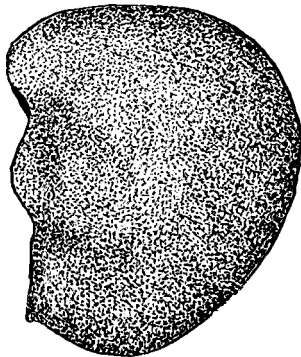
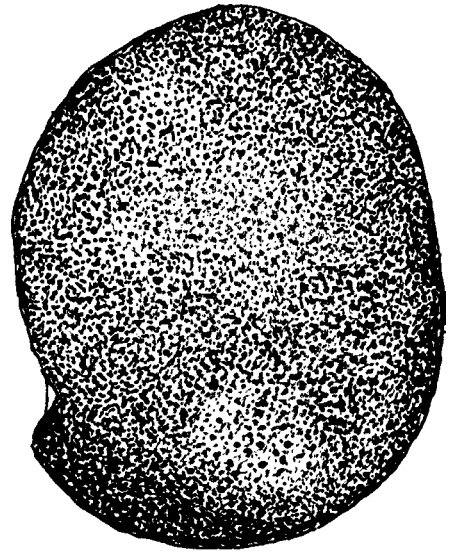


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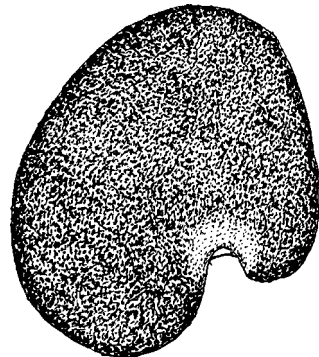
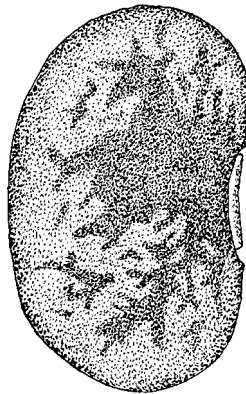
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South America; in the Carpathians cultivated in many cvs for edible legumes and beans.

**1605. *Glycine max* (L.) Merr., *Glycine soja* Siebold et Zucc., *Soja hispida* Moench** – Annual, stems 30-200 cm, erect, twiner, branched, with reddish-brown hairs. **Seeds circular or slight elliptic, more or less flattish, 6-10 x 6-8 mm. Surface smooth, dull or slight lustrous, testa often rugose, yellow, green, brown, black, unicoloured or spotted, according to the cultivar.  $2n = 40$ .** Originally growing in the eastern Asia; cultivated in fields as an important agricultural plant in warmer areas of the Carpathians.

**1606. *Vigna sinensis* Endl., *V. unguiculata* (L.) Walpers** – Annual, stems 15-200 cm high, erect, ascendent or procumbent, leaves trifoliate, inflorescence stalk axillar, pods 10-15 cm long. **Seeds ellipsoid, lateral slight compressed, with large hilum with black hem on ventral side, 8-11 x 5.5-6.5 mm. Surface smooth, dull, whitish, yellowish or pale-brown.** Native to tropical Africa; a worldwide important leguminous crop; in the Carpathians rarely cultivated in Mo, Ro, Uk.

**1607. *Dolichos lablab* L.** – Annual, stems erect, leaves trifoliate. **Seeds ellipsoid, flattish, with a white, narrow elliptic, arillate hilum, 8-10 x 6-7 mm. Surface smooth, dull, reddish, but very dense spotted or marbled with black spots.** Native to tropical Africa; in the Carpathians rarely cultivated as an ornamental, previously cultivated for palatable and nutritious paste production.

**1608. *Cicer arietinum* L., *C. grossum* Salisb., *C. sativum* Schkuhr** – Annual, stems 4-angular, ramified, pubescent, erect, 50-80 cm high. **Seeds nearly circular or ellipsoid to angular with a beak-like prominence, 7-10 x 5-9 mm. Surface rough,  $\pm$  rugose, dull, white-yellow, with longitudinal ribs on ventral side.  $2n = 14, 16, 24, 32$ .** Native to central Asia; in the Carpathians cultivated as leguminous plant for its edible seeds in some cvs, in warmer areas.

**1609. *Lepedeza bicolor* Turcz.** – Perennial, stems up to 1 m, erect, branched, twigs angular, reddish. **Seeds obovoid, flattish, hilum rounded, 3.3-3.7 x 2.3-2.5 mm. Surface smooth, glabrous, violetish-brown, spots dark-violet.** Originally spread from China and Japan, at forest edges, on rocky slopes;

in the Carpathians rarely cultivated as an ornamental plant.

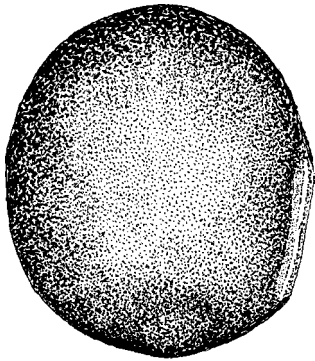
**1610. *Vicia angustifolia* L., *V. sativa* subsp. *nigra* (L.) Ehrh.** – Annual, stems procumbent, ascendent or erect, angular, branched, hairy at base. **Seeds globose, obovoid, hilum narrow elliptic, c. 1/5 of the circumference, 2.5-3 x 2.2-2.6 mm. Surface smooth, dull, olive-brown, red-brown (when fresh) to black-brown (old seeds) spotted or marbled with black spots.  $2n = 12$ .** Native to Eurasia, field weed, on grassy slopes, dry meadows and pastures; in warmer areas throughout the Carpathians.

**1611. *Vicia articulata* Hornem., *V. monanthos* (L.) Desf. non Retz.** – Annual, bare, 25-70 cm high, stems procumbent or ascendent, sometimes trailing, angular, poorly branched. **Seeds spherical or slight elliptic, strong flattish, margin rounded, 5-6.5 x 5-6 mm. Surface smooth, dull, pale-brown, with tiny darker brown and bigger black spots.  $2n = 14$ .** Native to the eastern Mediterranean, in the past cultivated on fields as a legume. Hu, Ro, Sk.

**1612. *Vicia biennis* L., *V. picta* Fisch. et Mey.** – Annual to biennial, stems branched, 1-1.5 m high, angular, glabrous or sparsely pubescent. **Seeds globose, hilum narrow elliptic, c. 1/3 of the perimeter, 2.5-3.5 x 2.5-3.2 mm. Surface smooth, dull, olive, brown to black, spotted to mottled with brown to black spots.  $2n = 14$ .** Native to central and eastern Europe, the Caucasus, western Siberia, in mixed forests and at their edges. Hu, Ro, Sk.

**1613. *Vicia bithynica* (L.) L., *Faba bithynica* (L.)** – Annual, glabrous or downy, stems erect, 20-60 cm, branched from the base. **Seeds subglobose, slight flattish, apex constricted, base often truncate, hilum elliptic to obovate about 1/8 of the perimeter, 5-6 x 4.5-5 mm. Surface smooth, dull, pale-brown to brown, with dark-brown or black spots.  $2n = 14$ .** Native to southwestern Europe, on dryer shrubberies, cereal fields, in warmer areas, very rarely hauling into the Carpathians.

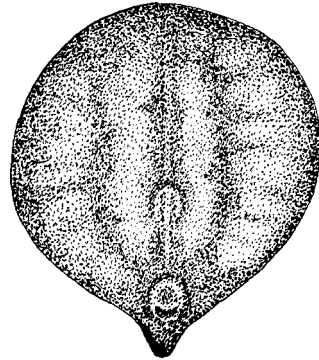
**1614. *Vicia cassubica* L., *V. multiflora* Poll.** – Perennial, stems 30-100 cm high, whole downy or nearly bare, poorly ramified. **Seeds broad ellipsoid, sometimes flattish, hilum narrow elliptic, c. 1/3 of the circumference, 3.2-4 x 2.8-3.6 mm. Surface dull, smooth, olive to dark-brown, unicoloured or**



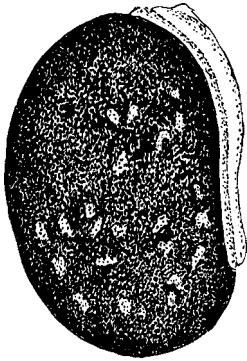
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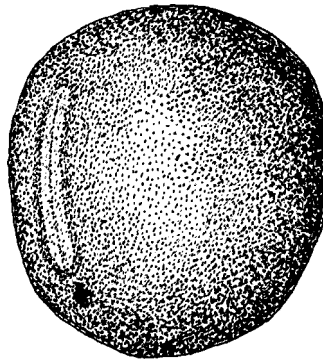
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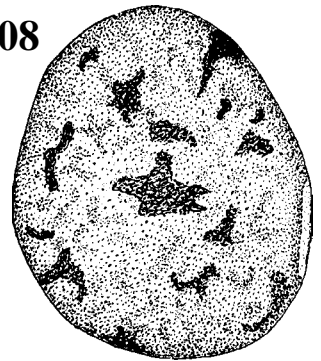
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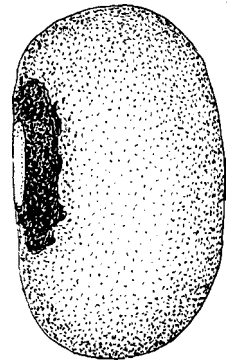
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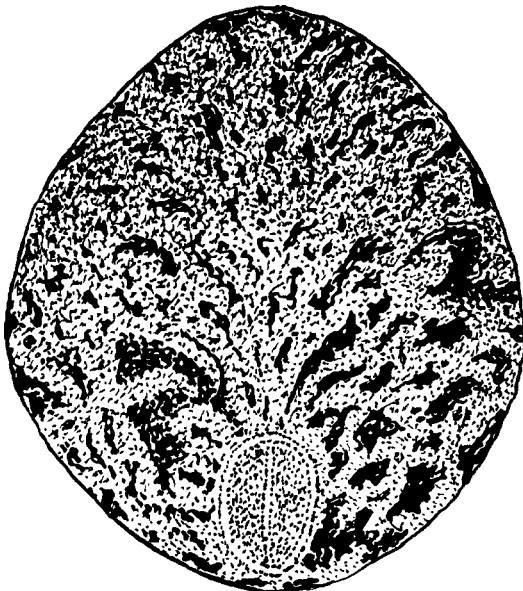
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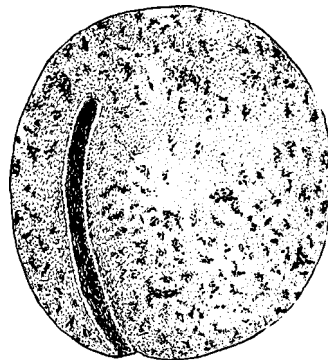
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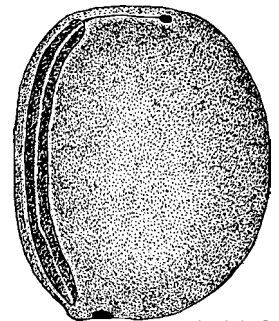
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1613



1612



1614

**spotted. 2n = 12.** Native to Europe and western Asia, on dryer soils, warmer areas, light forests, shrubby steppes. Br, Hu, Mo, Ro, Sk, Uk.

**1615. *Vicia cordata*** Wulf. ex Hoppe, *V. sativa* subsp. *cordata* (Wulf. ex Hoppe) Aschers. et Graebn. — Annual, stems 20-40 cm, leaflets oblong- or obovate-cuneate, truncate to emarginate, flower reddish-purple. **Seeds ± quadrangular, prismatic, with a rounded off-corner, hilum 1/6-1/5 of the circumference, 4-4.6 x 3.6-4 mm. Surface glabrous, slight lustrous, richly blackish-spotted. 2n = 10.** Native to whole Europe, on open slopes, in shrubberies and orchards.

**1616. *Vicia cracca*** L. — Perennial, stems 20-50 cm high, poorly branched, glabrous or shortly hirsute. **Seeds globose, broad ellipsoid, hilum narrow elliptic, c. 1/3 of the circumference, 2.3-2.8 x 2.3-2.8 mm. Surface smooth, dull, olive, to dark-brown (old seeds), usually dense blotched. 2n = 28.** Native to Eurasia, on meadows, pastures, light forests and shrubberies, fallow lands, river margins; throughout the Carpathians.

**1617. *Vicia dalmatica*** Kern., *V. altissima* Desf., *Vicia tenuifolia* Roth subsp. *dalmatica* (A. Kern.), *V. elegans* Guss. — Perennial, stems 30-65 cm high, strong, ramified. **Seeds globose, slight flattish, hilum narrow elliptic, 1/4 of the circumference, 3.4-4 x 3-3.5 mm. Surface smooth, dull, brown, greyish-brown to black, usually dense spotted. 2n = 12.** Native to southeastern Europe, extending northwards to Slovakia, in dry light forests, shrubs, on grassy slopes. Hu, Ro, Sk, Uk.

**1618. *Vicia dasycarpa*** Ten., *V. varia* Host, *V. glabrescens* (Koch) Heimerl — Annual to perennial, stems 50-130 cm high, hirsute, angular, slender. **Seeds irregular, globose to triangular, hilum broad elliptic, c. 1/8-1/6 of the perimeter, 3.5-4 x 3.5-4 mm. Surface dull, smooth, olive to brown (when fresh) dark-brown to black (old seeds). 2n = 14.** Native to southern Europe; in the Carpathians sowed as a component of fodder mixture, in warmer areas.

**1619. *Vicia dumetorum*** L., *V. desertorum* Link — Perennial, stems 80-150 cm high, twining, ramified, acutely angular. **Seeds globose to broad ellipsoid, hilum linear, c. 2/3 of the circumference, 4-5 mm in diam. Surface smooth, dull, red-brown to dark-grey, unicoloured or dark-spotted. 2n =**

**14.** Native to central Europe, forests and shrubberies, in lowlands and downs; throughout the Carpathians.

**1620. *Vicia ervilia*** (L.) Willd., *Ervilia sativa* Link, *Ervum ervilia* L. — Annual, stems 20-30 cm high, glabrous or dispersely downy, erect, angular. **Seeds oblique ovoid, ventral side flat to concave, transverse section broad ovate, side faces slanted towards the dorsal margin, hilum elliptic to obovate, 1/12-1/10 of the circumference, 3.5-4.5 x 4-4.6 mm. Surface dull, smooth, red-brown or marbled. 2n = 14.** Native probably to the Mediterranean region; in the Carpathians grown as a fodder plant in the past.

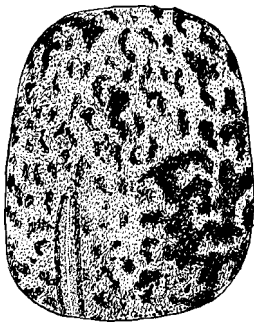
**1621. *Vicia grandiflora*** Scop., *V. sordida* Waldst. et Kit. — Annual, pubescent, seldom smooth, stems up to 60 cm high, ascendent, poorly ramified at base. **Seeds irregular globose, lenticular, hilum with two white membranous collars, c. 2/3-3/4 of the circumference, 3.5-4.5 x 3.2-3.6 mm. Surface smooth, dull, pale-brown, unicoloured or with many black spots. 2n = 14.** Native to southeastern Europe, hauling into central Europe with imported material. Hu, Mo, Pl, Ro, Sk, Uk.

**1622. *Vicia hirsuta*** (L.) S. F. Gray, *Ervum hirsutum* L. — Annual, whole downy, stems 20-70 cm high, branched, 4-angular. **Seeds ± lenticular, elliptic in outline, hilum narrow elliptic, 1/3 of the circumference, funiculus usually persistent, 2-2.5 x 2-2.5 mm. Surface smooth, dull, olive to buff-brown (when fresh) or henna (old seeds), spotted to mottled, spots violet. 2n = 14.** Native to Eurasia, on fields, pastures, dry meadows; shrubby slopes, forest margins; almost throughout the Carpathians.

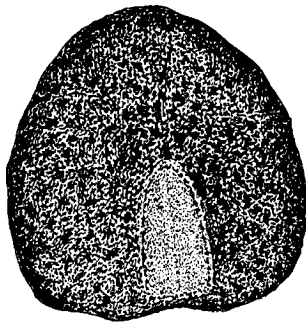
**1623. *Vicia hybrida*** L. — Annual, stems efficient, ramified, angular, up to 20-50 cm high, glabrescent or pubescent. **Seeds globose, hilum narrow elliptic, c. 1/10 of the circumference, 4-6 x 4-5.6 mm. Surface dull, faint tuberculate, pale-brown to dark-brown, spotted to mottled. 2n = 12.** Native to southern Europe, rocky limestone slopes, scrubs, grassy places, fields, sandy shores, hauling into central Europe. Ro.

**1624. *Vicia incana*** Gouan., *V. gerardii* All. — Perennial, stems 40-60 cm high, rough, erect, downy, ramified. **Seeds globose to oblate spheroid, sometimes slight flattish, hilum narrow elliptic, c. 1/4 of the circumference, 3-4.2 x 2.5-3 mm. Surface samite dull, glabrous, olive to chocolate brown,**

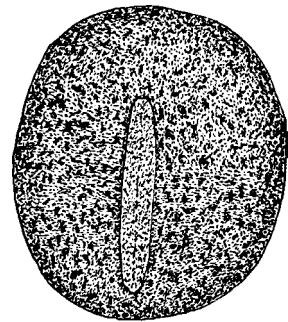




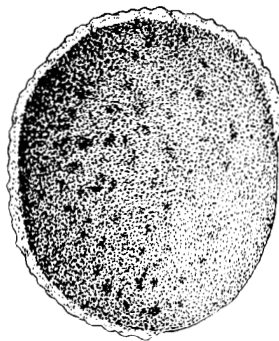
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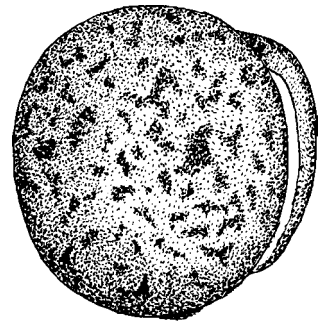
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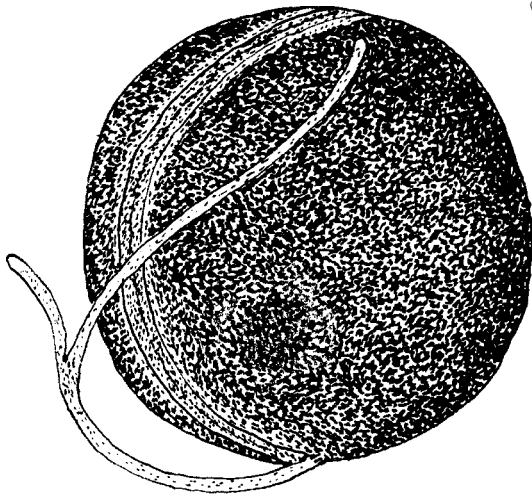
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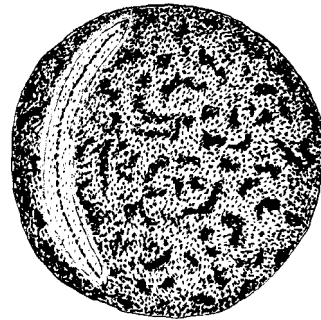
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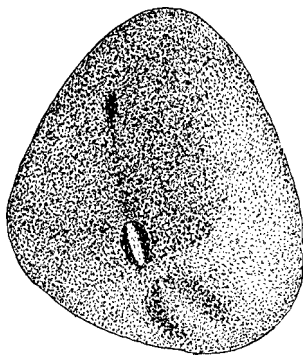
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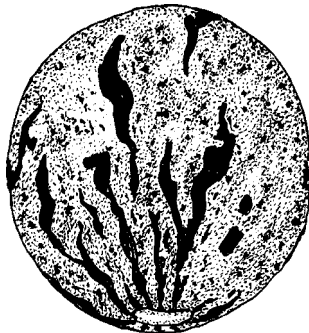
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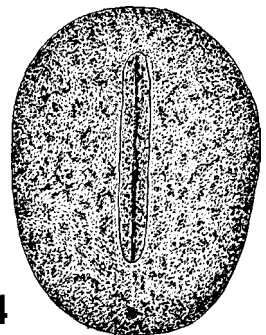
1616



1620



1623



1624

**minute spotted. 2n = 12.** Native to the mountains of Eurasia, in sunny shrubby slopes, forest margins, in dry calcareous soils. Sk.

**1625. *Vicia lathyroides* L., *Ervum soloniense* L.** — Annual, downy, stems 5-50 cm high, numerous, procumbent up to ascendent, ramified only at base. **Seeds broad ellipsoid-globose-cubic, side faces sometimes slight concave, hilum elliptic, c. 0.3-0.5 mm long, 1.3-2 mm in diam. Surface dull, dense tuberculate, nut-brown, grey-brown, red-brown to brown. 2n = 12.** Native to Eurasia, on sandy fields, dry meadows, pastures, fallows of warmer areas; in all Carpathian regions.

**1626. *Vicia lutea* L.** — Annual, stems procumbent or erect, 20-60 cm high, angular. **Seeds obovoid to globose, ± flattish, hilum narrow elliptic, c. 1/6-1/5 of the circumference, 4.5-5.8 x 4.5-5 mm. Surface smooth, dull, red- to dark-brown, spotted to marbled, spots dark-brown to black. 2n = 14.** Native to southern and central Europe, western Asia, western Africa, on fields, meadows, forests edges, shrubberies, in warmer stands. Hu, Mo, Ro, Sk.

**1627. *Vicia melanops* Sibth et Sm., *V. tricolor* Seb. et Mauri** — Annual, downy, stems 15-30 cm high, erect or ascendent. **Seeds globose, ± flattish, hilum narrow elliptic, c. 1/6-1/5 of the perimeter, 5-6.2 x 5-5.5 mm. Surface dull, smooth, dark-brown. 2n = 10.** Native to southwestern Europe, seldom hauling into central and eastern Europe, inclusive of the Carpathians.

**1628. *Vicia narbonensis* L., *Faba narbonensis* (L.) Schur** — Annual, stems erect, 20-60 cm high, pubescent, branched only at base, 4-angular. **Seeds broad ellipsoid to subglobose, flattish, hilum c. 1/8 of the circumference, 6-8 x 6-8 mm. Surface dull, smooth, greyish- to dark-brown, sometimes with dark-brown spots, hilum elliptic to obovate. 2n = 14.** Native to the Mediterranean; in the Carpathians seldom grown for fodder.

**1629. *Vicia oroboides* Wulfen** — Perennial, up to 25-50 cm high, glabrescent or sparsely pubescent, racemes 2- to 12-flowered. **Seeds ± spherical, lateral slight compressed, hilum narrow elliptic, c. 1/2 of the circumference, 3.1-3.5 x 2.8-3.2 mm. Surface glabrous, lustreless, greenish or brownish, with violet spots. 2n = 14.** Native to the Alps, extending to western Hungary, in meadows, mountain woods, calcicole. Hu.

**1630. *Vicia pannonica* Crantz** — Annual, downy up to hairy, stems procumbent or ascendent, twining, 10-60 cm high, ramified only at base. **Seeds broad ellipsoid to globose or lenticular, ± lateral flattish, hilum narrow elliptic, 1/8-1/5 of the perimeter, 3.5-4.5 x 3.5-4.2 mm. Surface smooth, dull, dark-brown to black, spotted to mottled. 2n = 12.** Native to Eurasia, on pastures, fallows, field weed, boundaries, grown for fodder in mixture with rye or wheat. Hu, Mo, Pl, Ro, Sk, Uk.

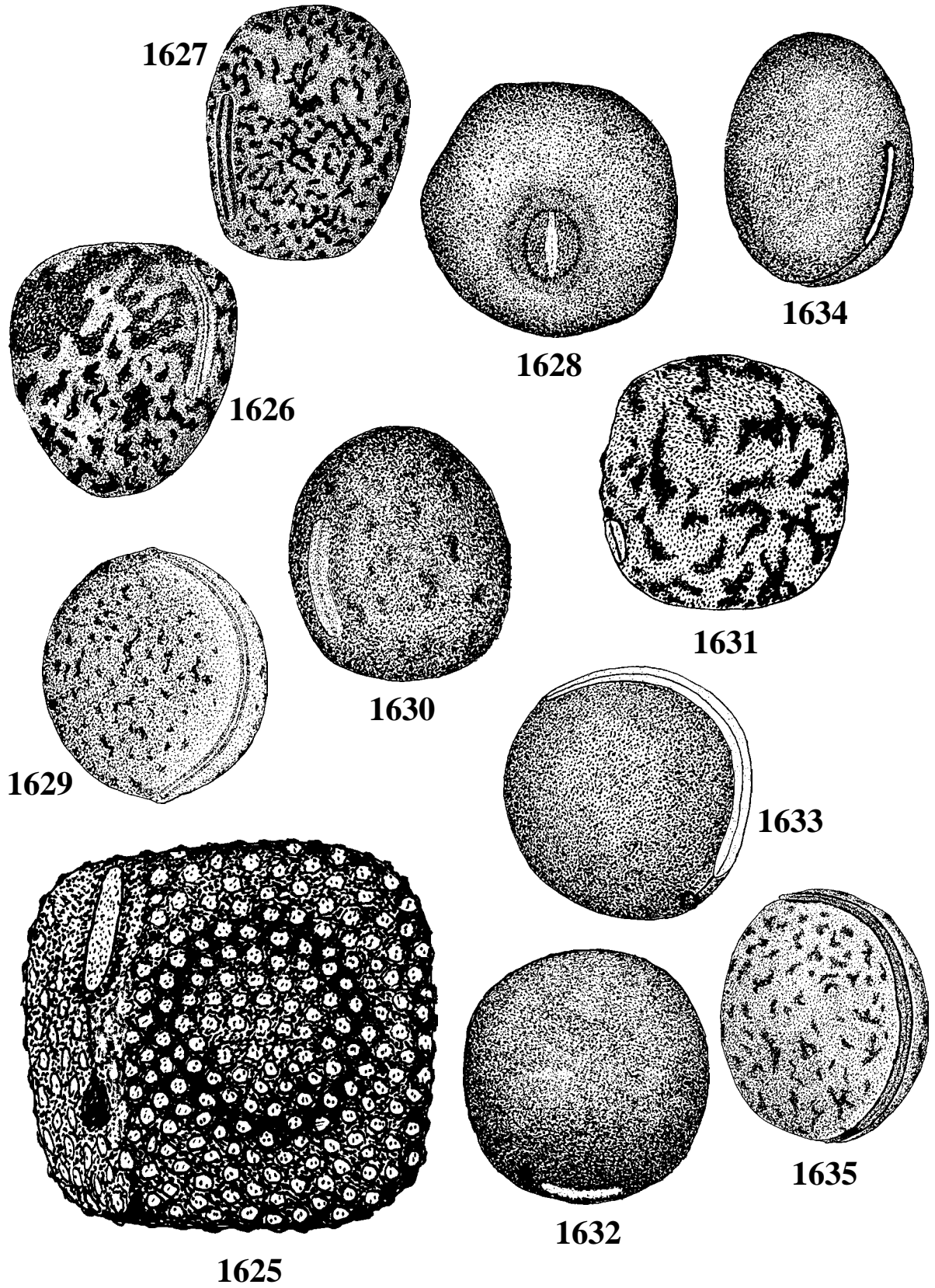
**1631. *Vicia peregrina* L.** — Annual, stems ascendent, angular, branched, 20-100 cm high. **Seeds square to subglobose, hilum broad elliptic, c. 1/12-1/10 of the circumference, 4.5-5 x 4.5-5 mm. Surface smooth, dull, cream with pale-brown spots, or olive to brown, dense black-spotted or mottled. 2n = 12, 14.** Native to southern Europe, on rocks, free dry slopes, fallows. Hu, Mo, Ro, Uk.

**1632. *Vicia picta* Fisch. et Mey., *V. cumana* Hazsl.** — Annual to biennial, stems branched, 1-1.5 m, glabrous or a little hirsute. **Seeds ± spherical or oval-spherical, slight compressed, 4-4.5 x 4-4.3 mm. Surface very fine waved, lustreless, dark-brown. Native to Euro-Siberia, on slight saline stands, woods, moist soils. Hu, Ro, Uk.**

**1633. *Vicia pisiformis* L.** — Perennial, stems up to 200 cm high, twining, glabrous, upper part poorly branched. **Seeds globose, broad ellipsoid, hilum linear, c. 1/2 of the perimeter, 4-5 x 4-5 mm. Surface velvet, dull, smooth, olive- to rusty-brown, unicoloured. 2n = 12.** Native to central and eastern Europe, Asia Minor and the Caucasus, in deciduous light forests and shrubberies, forest edges and clearings to warmer areas. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**1634. *Vicia sativa* L. subsp. *sativa*** — Annual, stems 10-100 cm high, ascendent or erect, angular, sometimes branched at base. **Seeds broad ellipsoid to globose, often somewhat angular, ± flattish, hilum narrow elliptic, c. 1/7 of the circumference, 5-7 x 4-6 mm. Surface smooth, dull, usually brownish, often with brown and black spots. 2n = 12.** Native to the Mediterranean, usually grown for fodder in many cultivars, often naturalized on fallows, boundaries, sunny slopes; throughout the Carpathians.

**1635. *Vicia sepium* L.** — Perennial, stems erect or twining, 30-100 cm high, angular, usually pubescent, ramified from the base. **Seeds ellipsoid to globose,**



**lenticular, hilum linear, c. 2/3 of the circumference, 3-3.8 x 3-3.2 mm. Surface smooth, dull, olive, buff-brown, often spotted-marbled purple- and black-brown. 2n = 14.** Native to Euro-Siberia, on meadows, in shrubberies, weed of cereals, road margins; in all Carpathian territories.

**1636. *Vicia serratifolia*** Jacq. — Annual, 30-60 cm high, stem c. 5 mm in diam., scarcely hirsute, dense branched. **Seeds spherical, dorsal side rounded, ventral truncate, deep deflexed, hilum ellipsoidal, 4.8-5.8 in diam. Surface foveolate, faint lustrous, blackish-brown. 2n = 14.** Native to southern Europe, western Asia, in arable soils, grassy places, shrubberies. Ro.

**1637. *Vicia sparsiflora*** Ten., *Orobis ochroleucus* Waldst. et Kit. — Perennial, stems up to 100 cm, downy. **Seeds globose, hilum broad elliptic, c. 2/5 of the circumference, 4-4.5 x 3.4-3.8 mm. Surface glabrous, dull, dark-brown, spots black. 2n = 12.** Native to the Balkan Peninsula and Pannonia, in moister forests and their edges and clearings. Hu, Ro, Sk.

**1638. *Vicia striata*** M. Bieb., *V. panonica* Crantz subsp. *striata* (M. Bieb.) Nyman — Annual, flowers dirty-violet, sometimes with yellow tinge. **Seeds round-off, more angular to globose, hilum broad elliptic, c. 1/6 of the perimeter, 2.8-3.4 x 2.6-3.2 mm. Surface samite dull, smooth, light-, olive- to rusty-brown, with dark-brown spots to marbled. 2n = 12.** Native to Eurasia, as field weed of the warmest regions. Hu, Mo, Ro, Sk.

**1639. *Vicia sylvatica*** L., *Ervum sylvaticum* (L.) Peterm. — Perennial, stems 60-200 cm, twining, branched, 4-angular. **Seeds broad ellipsoid to globose, hilum linear, 2/3-3/4 of the circumference, 3-4 x 2.8-3.4 mm. Surface smooth, dull, olive, olive-brown to brown, sometimes spotted, dark-brown to black. 2n = 14.** Native to boreal Euro-Siberia, in moister forests, mountains meadows, forest edges and clearings; throughout the Carpathians.

**1640. *Vicia tenuifolia*** Roth, *V. cracca* L. subsp. *tenuifolia* (Roth) Gaudin — Perennial, stems thin, stiff, mostly erect, glabrous or appressed pubescent. **Seeds broad ellipsoid to globose, ± flattish, hilum narrow elliptic, c. 1/5 of the perimeter, 3-4.5 x 2.5-3.5 mm. Surface dull, smooth, reddish- black-brown, sometimes spotted, spots dark-brown to**

**black. 2n = 24 (12).** Native to Eurasia, on rocky and stony sunny slopes, in forests, fields; throughout the Carpathians.

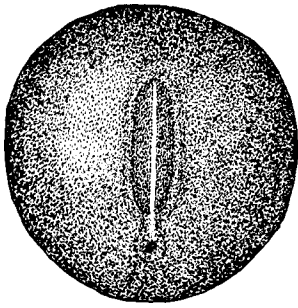
**1641. *Vicia tenuissima*** (M. Bieb.) Schinz et Thell., *V. gracilis* Loisel. non Banks et Solander — Annual, up to 20-60 cm high, subglabrous, leaflets 2-5 pairs. **Seeds spherical, hilum c. 1/10 of the circumference, 2.2-2.7 x 2-2.4 mm. Surface glabrous, pale-brown, spotted. 2n = 14.** Native to southwestern Europe, in dry grassy and sowed habitats. Ro.

**1642. *Vicia tetrasperma*** (L.) Schreb., *Ervum tetraspermum* L. — Annual, stems 10-60 cm high, procumbent and twining, weakly angular, thin. **Seeds globose, sometimes flattish, hilum broad elliptic, 1/6-1/5 of the circumference, 1.6-2.2 x 1.7-2.2 mm. Surface smooth, dull, olive-green, nut-brown (when fresh), red-brown to brown (old seeds), dense spotted. 2n = 14.** Native to Eurasia; on pastures, fallows, sandy soils, forest edges, fields; throughout the Carpathians.

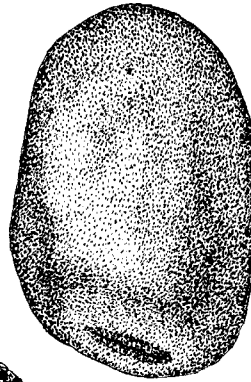
**1643. *Vicia villosa*** Roth, *V. polyphylla* Waldst. et Kit. — Annual to perennial, stems 30-200 cm high, ramified, often twining. **Seeds globose or broad ellipsoid, hilum narrow elliptic, c. 1/10-1/6 of the circumference, 3-4 mm in diam. Surface smooth, dull, reddish- to black-brown, sometimes spotted. 2n = 14.** Native to Europe, on dryer meadows, pastures, boundaries, shrubby sunny slopes, weed in fields; throughout the Carpathians.

**1644. *Faba bona*** Medik., *Faba vulgaris* Moench, *Vicia faba* L. — Annual, bare, 40-60 cm high, stems up to 1 cm in diam., 4-angular, hollow. **Seeds broad ellipsoid, flattish, hilum basal to subbasal, elliptic, c. 1/8 of the circumference, 5-24 x 3.5-10 mm. Surface lustrous to glossy, smooth, buff-green to black-brown. 2n = 12, 14.** Native probably to the Orient or northern Africa; since prehistoric times cultivated for its edible seeds (subsp. *bona*) — a, and as fodder in two subsp.: *equine* — b, and *minor* — c; resp. in many cvs.

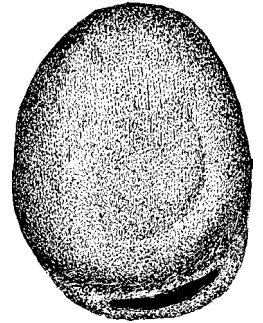
**1645. *Lens culinaris*** Medik., *L. esculenta* Moench — Annual, central stems erect, lateral procumbent or ascendent. 10-40 cm high, thin, narrowly winged. **Seeds lenticular, globose, slight ellipsoid, strong flattish, hilum flush, with length c. 1/12-1/10 of the perimeter, 4-6 x 4-7 mm. Surface dull to lustrous, smooth, clear unicoloured, usually henna to dark-brown, sometimes with small black spots.**



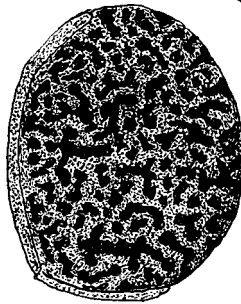
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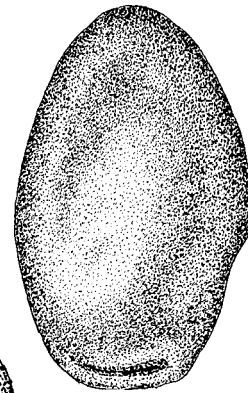
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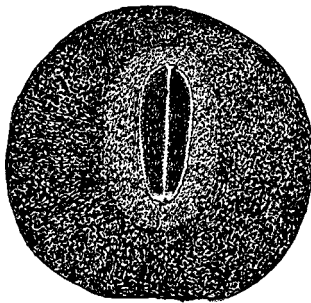
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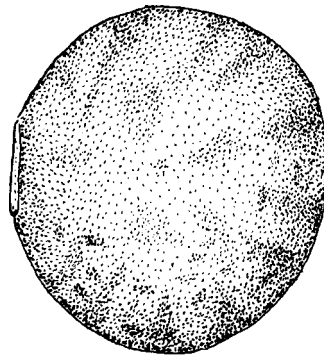
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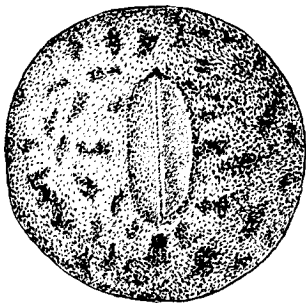
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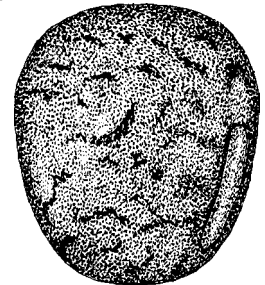
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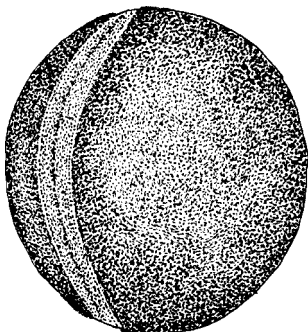
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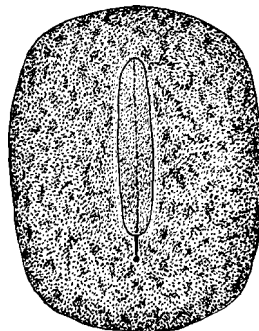
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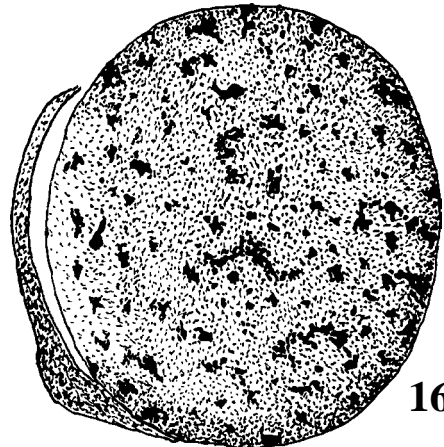
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1641

**2n = 12, 14.** Native probably to western Asia; in the Carpathians cultivated since prehistoric periods as a legume in subsp. *macrosperma* (Baumg.) Baroulina, uniquely naturalized.

**1646. *Lens microsperma*** Baumg. — Annual, small plant, with short vegetation period (65-80 days). **Seeds ± roundish, strong compressed lateral, bottom with a small hilum, 2.1-2.3 x 2.2-2.4 mm. Surface smooth, dull, pale-brown or brown and dark-brown marbled.** Native to western Asia, naturalized in southern Europe, rarely cultivated on fields as a legume. Ro.

**1647. *Lens nigricans*** (M. Bieb.) Godron — Annual, stems 15-30 cm high, flowering shoots terminated by a long filiform prominence. **Seeds ± spherical, lateral strong compressed, hilum longitudinal, 4-4.4 x 3.8-4.2 mm. Surface smooth, dull or faint lustrous, black.** Native to the western Asia, on stony slopes, in shrubberies; rarely hauling into the Carpathians, naturalized. Ro.

**1648. *Lens orientalis*** (Boiss.) M. Popov — Annual, stems 10-20 cm high, racemes slight longer than leaves, stipules oblong-lanceolate, entire, peduncles not or shortly aristate. **Seeds rounded, lateral strong compressed, hilum ellipsoid, 3.3-3.6 x 3.3-3.6 mm. Surface smooth, lustreless, pale-brown with blackish spots.** Native to the southwestern Asia, in open grassy slopes, among *Juniperus communis*, rare. Uk.

**1649. *Lathyrus annuus*** L. — Annual, glabrous, stems procumbent or trailing, 40-100 cm long, 4-angular, with two wings. **Seeds globose, transversal section circular, hilum c. 1/10-1/9 of the circumference, 3.5-4.5 x 3.5-4.5 mm. Surface coarse tuberculate or papillose, greyish- or violet-brown. 2n = 14.** Native to the Mediterranean; hauling into the Carpathians on waste and cultivated grounds, sometimes grown for fodder.

**1650. *Lathyrus aphaca*** L., *L. segetum* Lam. — Annual, bare, stems ascendent or twining, 10-100 cm high, angular, ± unbranched. **Seeds ellipsoid to globose, usually flattish, hilum elliptic to obovate, c. 1/12-1/8 of the circumference, 3.2-3.6 x 2.6-3 mm. Surface glossy, smooth, dark purple-brown to black (old seeds), sometimes spotted to marbled. 2n = 14.** Native to Eurasia, on fields, boundaries, fallows. Hu, Mo, Ro, Sk, Uk.

**1651. *Lathyrus aureus*** (Stev.) Brandza, *Orobis orientalis* Boiss. — Perennial, robust, pubescent, glandular, stems erect, 20-70 cm high. **Seeds ellipsoid to oval, hilum white, narrow elliptic, c. 1/4 of the circumference, 4-4.5 x 3-3.5 mm. Surface smooth, lustrous, plum or dark-purple.** Native to the southeastern Europe and Asia Minor, in forests, shrubberies. Mo, Ro, Uk.

**1652. *Lathyrus cicera*** L. — Annual, glabrous, stems procumbent, ascending or erect, 20-100 cm high, branched at base, narrowly winged. **Seeds oblique to broad ovoid, ventral side flat to concave, side faces slanted towards the dorsal margin, 4.5-5.5 x 4.5-5.5 mm. Surface dull, smooth to faint ruminated, brown to grey. 2n = 14.** Native to the Mediterranean; seldom cultivated as legume and for fodder; in warmer areas of the Carpathians.

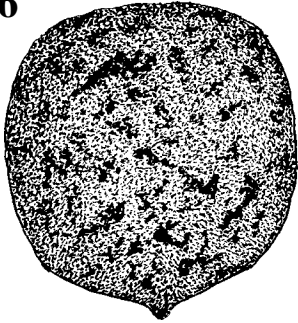
**1653. *Lathyrus clymenum*** L. subsp. *enclymenum* Briq. — Annual, stems bare, 30-100 cm high, procumbent or trailing, winged. **Seeds ellipsoid, lateral compressed, hilum c. 2/3 of the seed length, 5-6.7 x 4.5-5.5 mm. Surface glabrous, pure or blackish spotted, dark-brown. 2n = 14.** Native to the Mediterranean; rarely hauling into the Carpathians, in warmer areas.

**1654. *Lathyrus gmelini*** Fritsch, *L. luteus* (L.) Peterm. non Moench — Glabrous or sparsely pubescent, leaflets in 2-4 pairs, 20-50 mm wide, elliptical or ovate. **Seeds oval, hilum 1/4 up to 1/3 of the seed, 3.2-4 x 2.8-3.2 mm. Surface glabrous, pale or reddish-brown, faint lustrous.** Native to the mountains of central Asia; rare in the Carpathians. Mo.

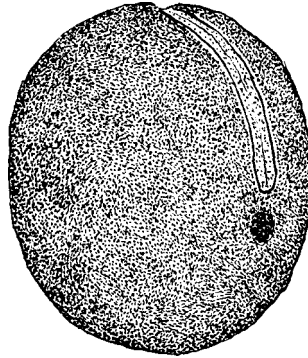
**1655. *Lathyrus hallersteinii*** Baumg. — Perennial, stems 4-angular, procumbent or ascending, glabrous, 30-40 cm high. **Seeds spherical or ellipsoid, lateral slight flattish, hilum 1/3-1/2 of the height, 2.8-3.2 x 2.4-2.6 mm. Surface glabrous, lustrous, reddish-brown, violet-spotted. 2n = 14.** Native to southern Europe (Romania, former Yugoslavia), in woods, shrubberies, in upland and montane zone. Ro.

**1656. *Lathyrus heterophyllus*** L. — Perennial, glabrous or downy, stems 1 to 3 m high, procumbent, winged. **Seeds spheroidal, globose, cubic, hilum 1/3 of the circumference, 4.8-6 x 4-5 mm. Surface dull, tuberculate, ruminate, greyish-brown to brown-black, dark-spotted. 2n = 14.** Native to southwestern and central Europe, at forest edges, shrubby slopes and overgrown rocks. Pl.

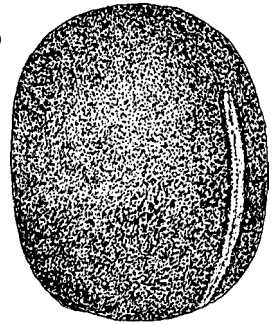
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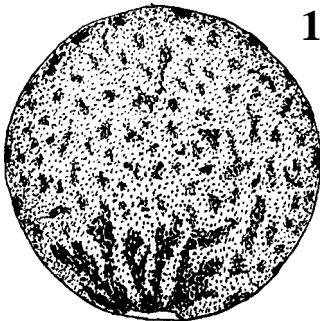
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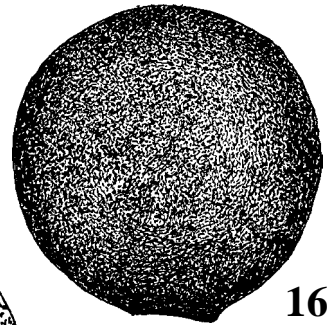
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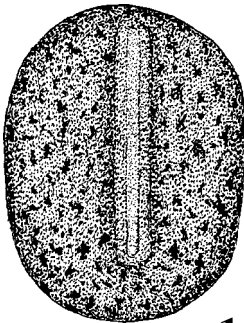
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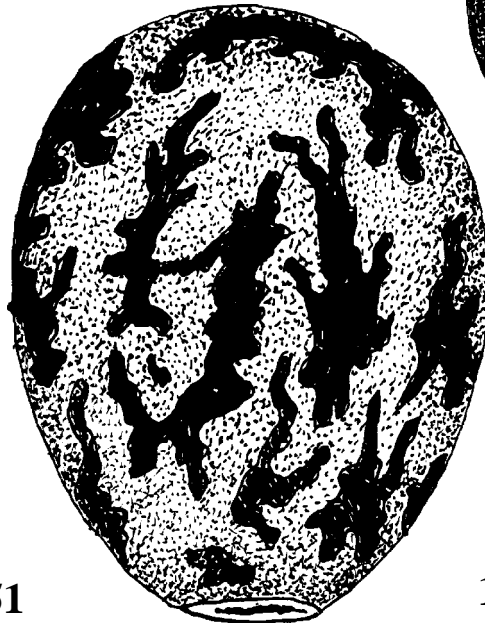
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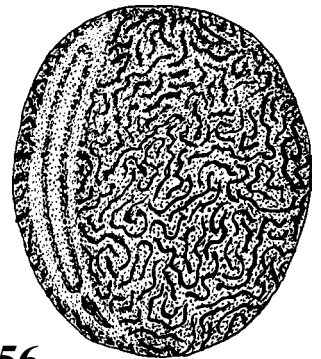
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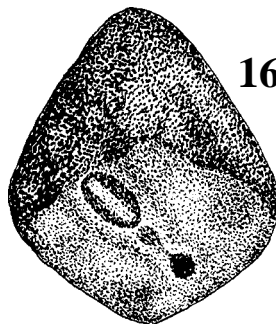
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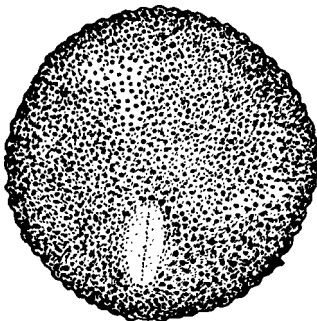
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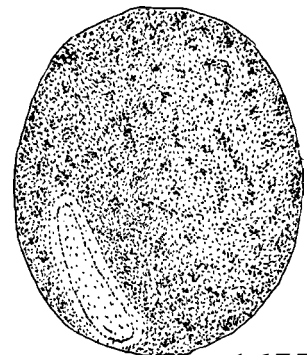
1652



1649



1655





**1657. *Lathyrus hirsutus* L., *L. hirtus* Ten., *L. variegatus* Host** — Annual, glabrous or scattered hairy, stems 30-100 cm, ascendent or erect and twining branched from the base. **Seeds globose, broad ellipsoid, hilum elliptic to obovate, c. 1/8-1/7 of the circumference, 3-4 x 3-4 mm. Surface dull, tuberculate, ruminate to foveolate, nut-brown to dark purple-brown. 2n = 14.** Native to Eurasia, in fields, boundaries, embankments, stone-pits. Hu, Mo, Pl, Ro, Sk, Uk.

**1658. *Lathyrus laevigatus* (Waldst. et Kit.) Gren., *Orobis laevigatus* Waldst. et Kit.** — Perennial, robust, glabrous, stems 30-80 cm high, branched. **Seeds ellipsoid or spherical, hilum half of the seed length, often with a large depression below, 4-4.6 x 3-3.5 mm. Surface glabrous, pure, pale-brown. 2n = 14.** Native to the Alps, Balkan Peninsula, in forest meadows and clearings, in montane and subalpine zones. Br, Pl, Ro, Sk, Uk.

**1659. *Lathyrus latifolius* L., *L. megalanthus* Steud.** — Perennial, bare or downy, stems 50-200 cm high, procumbent to twining, broad winged. **Seeds cylindric to globose, or conical, hilum 2/5-1/2 of the circumference, 5-6 x 3.5-4.5 mm. Surface greyish- or reddish-brown, dull, stark tuberculate, ruminate, with irregular mounds. 2n = 14.** Native to lowlands and uplands of Europe, in shrubberies, sunny deciduous forests, rocky steppes. Hu, Mo, Pl, Ro, Sk, Uk.

**1660. *Lathyrus laxiflorus* (Desf.) O. Kuntze, *L. inermis* Rochel ex Friv.** — Perennial, downy up to glabrous, stems 20-50 cm. **Seeds cylindric, elliptic, hilum narrow elliptic, c. 1/10-1/8 of the circumference, 3-4 x 2.4-2.8 mm. Surface glossy, smooth, yellowish-brown to reddish-brown, unicoloured or faint spotted. 2n = 14.** Native to southeastern Europe, in mountain woods. Ro.

**1661. *Lathyrus linifolius* (Reichard) Bässler, *L. montanus* Bernh.** — Perennial,  $\pm$  bare, stems ascendent or erect, 15-50 cm high, poorly ramified only at the bottom, narrowly 2-winged. **Seeds nearly globose or compressed globose, hilum narrow elliptic, c. 1/3 of the circumference, 2.5-3 mm in diam. Surface smooth, dull, olive-green to reddish-brown, unicoloured or with indistinct spots. 2n = 14.** Native to the montane zone of Europe, in light forests and clearings, pastures, in sand-stony soils. Br, Hu, Pl, Sk.

**1662. *Lathyrus maritimus* (L.) Bigelow, *Pisum maritimum* L.** — Racemes 5- to 12-flowered, calyx usually glabrous, corolla 14-20 mm. **Seeds oval, transversal section rounded, hilum c. 1/4-1/3 of the circumference, 4.9-5.5 x 4.1-4.5 mm. Surface fine waved, dull, dark-brown. 2n = 14.** Native to northern Europe. Pl.

**1663. *Lathyrus niger* (L.) Bernh., *Orobis niger* L.** — Perennial, bare, stems erect, 20-90 cm, angular, ramified. **Seeds ellipsoid to globose, elliptic in outline, hilum narrow elliptic, c. 1/4-1/3 of the circumference, 3.5-4.2 x 2.6-3 mm. Surface smooth, lustrous, olive-green to purple-brown, sometimes spotted. 2n = 14.** Native to Europe and western Asia, in dry light forests and clearings, shrubberies; throughout the Carpathians.

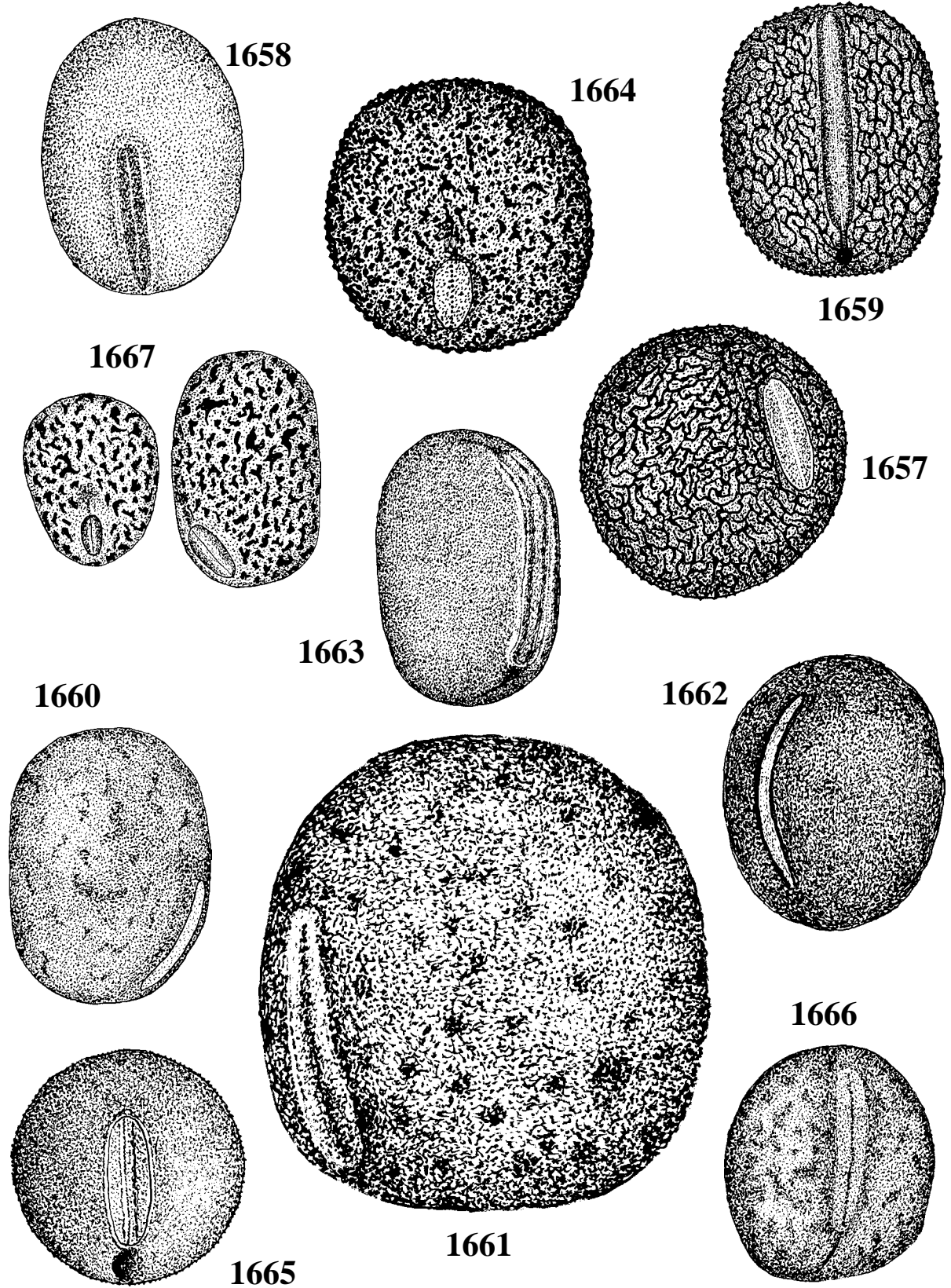
**1664. *Lathyrus nissolia* L., *L. gramineus* A. Kern** — Annual, bare or scattered downy, stems 20-90 cm, erect, weakly 4-angular. **Seeds broad ellipsoid to globose, flattish, hilum elliptic to obovate, c. 1/10-1/7 of the circumference, 1.8-3 x 1.6-2.8 mm. Surface lustrous, dense tuberculate, henna to dark-brown. 2n = 14.** Native to the downs of Europe, in light shrubberies, forest margins, pastures. Hu, Mo, Pl, Ro, Sk, Uk.

**1665. *Lathyrus odoratus* L.** — Annual,  $\pm$  downy, stems 20-200 cm long, poorly branched, 2-winged. **Seeds globose to compressed globose, hilum elliptic to obovate, c. 1/7-1/5 of the perimeter, 4.2-5 x 4-5 mm. Surface dull, fine tuberculate, greyish- to dark-brown. 2n = 14.** Native to southern Europe; commonly cultivated in gardens as an ornamental summer plant.

**1666. *Lathyrus palustris* L., *L. pilosus* Cham., *Orobis palustris* (L.) Rchb.** — Perennial, glabrous or sparsely downy, stems 20-120 cm, procumbent or twining. **Seeds globose to broad ellipsoid, hilum narrow elliptic, c. 1/6-1/4 of the circumference, 2.5-3.5 x 2.2-3.2 mm. Surface lustrous, smooth, mottled to marbled in reddish-brown to black. 2n = 42.** Native to most of Europe, on damp to moist meadows, coastal shrubberies, overgrown swamps; throughout the Carpathians.

**1667. *Lathyrus pannonicus* (Jacq.) Garcke, *L. albus* (L. fil.) Kittel, *Orobis albus* L. fil.** — Perennial, bare or scattered downy, stems 15-50 cm high, erect or ascendent angular. **Seeds compressed globose to cylindric or ovate, hilum elliptic, c. 1/8 of the perimeter,**





**2.3-3.5 x 1.8-2.8 mm. Surface smooth, brown with darkish spots.  $2n = 14$ .** Native to Euro-Siberia, in light, dry, mostly calcareous stands, shrubby and sunny slopes; in all Carpathian territories.

**1668. *Lathyrus pisiformis* L., *Orobis pisiformis* (L.) Wender.** – Perennial, bare, stems 50-100 cm high, trailing,  $\pm$  unbranched, winged, ciliate. **Seeds spherical or slight ellipsoid, hilum c. 1/2 of the circumference, 4-4.4 x 3.8-4.1 mm. Surface ruminate to foveolate, dull, dark-brown.  $2n = 14$ .** Native to Eurasia, in light mixed woods. Hu, Pl, Ro, Sk, Uk.

**1669. *Lathyrus pratensis* L., *Orobis pratensis* (L.) Döll** – Perennial,  $\pm$  bare, stems 30-120 cm, procumbent or twining, branched, angular. **Seeds ellipsoid to globose, slight flattish, hilum elliptic, c. 1/7 of the circumference, 2.5-3.5 x 2.5-3 mm. Surface glossy, smooth, buff-brown, orange-brown (fresh seeds) to red-brown (old seeds), spotted.  $2n = 14$ .** Native to Eurasian lowland to mountain zones, on damp stands; throughout the Carpathians.

**1670. *Lathyrus sativus* L., *Cicerula alata* Moench** – Annual, glabrous, stems procumbent or twining, ramified, 30-100 cm, 4-angular and broadly 2-winged. **Seeds oblique ovoid, ventral side flat to concave, side faces slanted towards dorsal margin, hilum elliptic, c. 1/16-1/10 of the circumference, 6-9 x 6-8 mm. Surface smooth, lustrous, colour very variable, mostly yellowish or dark-brown.  $2n = 14$ .** Place of origin unknown, in the past cultivated as legume and for fodder, widely naturalized. Hu, Mo, Ro, Sk, Uk.

**1671. *Lathyrus sphaericus* Retz., *L. coccineus* All.** – Annual, glabrous or downy, stems 10-40 cm high, winged. **Seeds globose to broad ellipsoid, hilum obovate to elliptic, c. 1/12-1/9 of the circumference, 2.8-3.2 x 2.6-3 mm. Surface smooth, spotted.  $2n = 14$ .** Native to central and southeastern Europe, at road edges, in fields, sunny shrubberies, meadows, pastures, vineyards. Hu, Ro, Sk.

**1672. *Lathyrus sylvestris* L.** – Perennial, glabrous or downy, stems numerous, 60-120 cm high, procumbent, ascendent or twining, 4-angular, 2-winged. **Seeds broad ellipsoid to globose, hilum narrow elliptic, c. 1/3-1/2 of the circumference, 4-5 x 3.5-4.5 mm. Surface dull, tuberculate, ruminate, violet- to purple-brown.  $2n = 14$ .** An Euro-Siberian element, in deciduous or mixed woodlands, clearings

and wood edges on calcareous soils. Br, Hu, Mo, Pl, Ro, Sk, Uk.

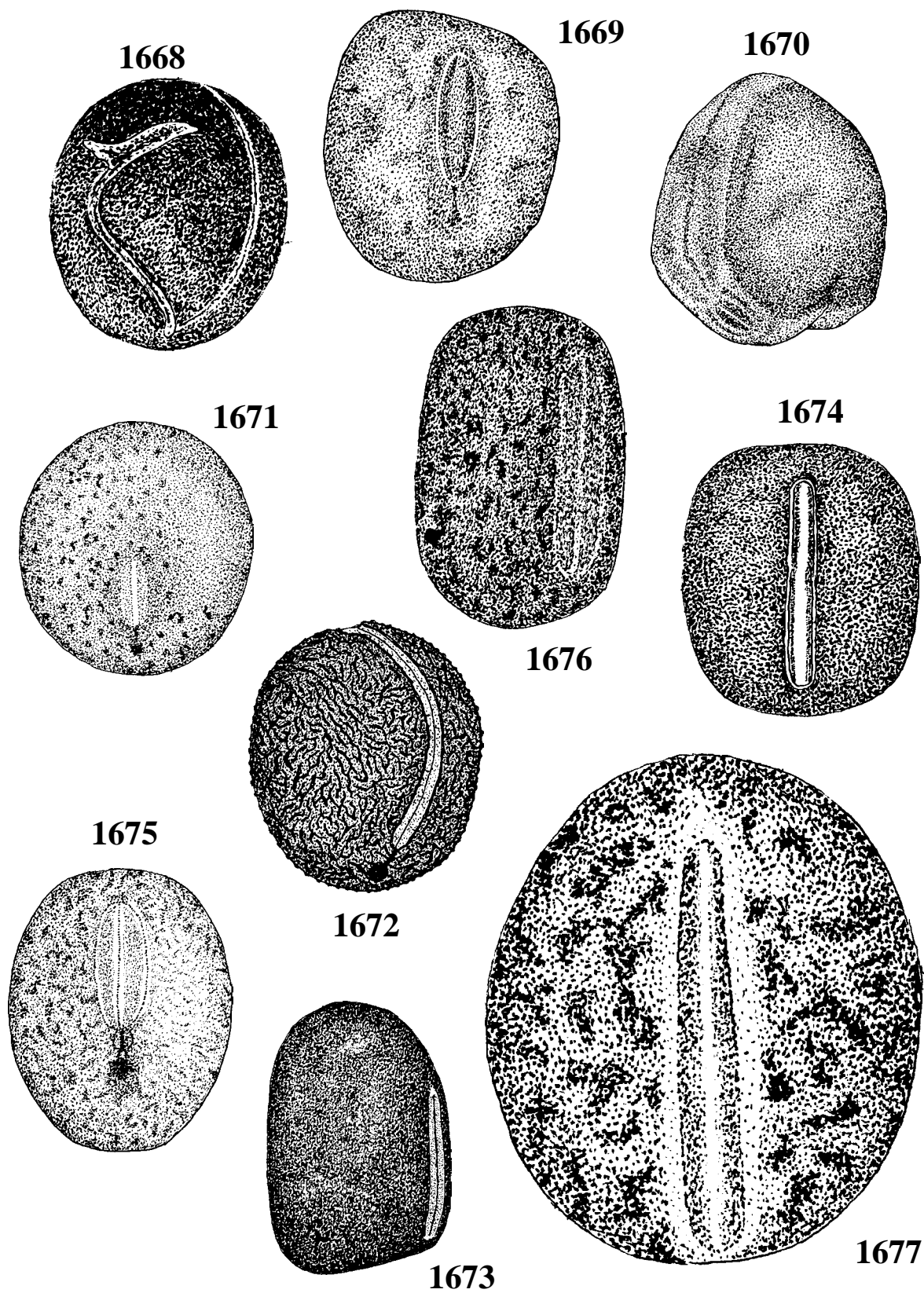
**1673. *Lathyrus tingitanus* L.** – Annual, bare, stems up to 100 cm high, procumbent or twining, winged. **Seeds prolonged ellipsoid, flattish, apex rounded, base truncate, hilum narrow elliptic, c. 1/6 of the circumference, 7-8 x 5-5.5 mm. Surface smooth, dull, cream to greyish- up to dark-brown, base unicoloured, spotted to marbled.** Originally growing in northern Africa; cultivated in gardens as an ornamental plant, seldom naturalized. Ro.

**1674. *Lathyrus transsilvanicus* (Spreng.) Fritsch, *Orobis transsilvanicus* Spreng.** – Perennial, stems 50-70 cm, dispersed hairy, erect, angular, robust. **Seeds ellipsoid to globose, sometimes flattish, hilum narrow elliptic, c. 1/10 of the circumference, 3.4-4 x 3-3.6 mm. Surface smooth, slight lustrous, sandy-brown to purple-brown.  $2n = 14$ .** A Carpathian endemic, growing at forest edges, in clearings and shrubberies. Hu, Ro, Sk, Uk.

**1675. *Lathyrus tuberosus* L.** – Perennial, glabrous, stems procumbent, not winged, stems 30-100 cm, acute 4-angular. **Seeds ellipsoid to globose, hilum elliptic to obovate, c. 1/6-1/5 of the perimeter, 3.8-4.8 x 3-4.1 mm. Surface dull, tuberculate, ruminate to almost smooth, nut- to dark-brown.  $2n = 14$ .** Native to western Asia, hauled into the Carpathians in ancient times, on fields, road edges, boundaries, fallows, of warmer areas; throughout the Carpathians.

**1676. *Lathyrus venetus* (Mill.) Wohlf., *Orobis venetus* Mill.** – Perennial, glabrous, pubescent, stems 20-40 cm, erect or ascendent,  $\pm$  branched. **Seeds spheroid to ellipsoid, cubic to ovoid, hilum elliptic, c. 1/4-1/3 of the perimeter, 3-4 x 2-2.7 mm. Surface sandy-, greyish- to blackish-brown, spotted to marbled, smooth, slight lustrous.  $2n = 14$ .** Native to southern Europe, in woodlands, shrubberies, stony dry soils, in warmer areas. Hu, Mo, Ro, Sk, Uk.

**1677. *Lathyrus vernus* (L.) Bernh., *Orobis vernus* L.** – Perennial, bare or dispersely hairy, stems single, erect, angled, 20-40 cm high, unbranched, angular. **Seeds ellipsoid to globose, transverse section circular, hilum elliptic to obovoid, c. 1/4-1/3 of the perimeter, 2.8-4 x 2.2-3 mm. Surface smooth, lustrous, olive-green to nut-brown (when fresh) to dark purple-brown (old seeds), usually spotted.  $2n = 14$ .** An Euro-Siberian element, in deciduous and



mixed woodlands, in soils rich in nutrients; throughout the Carpathians.

**1678. *Ononis arvensis* L., *O. altissima* Lam., *O. hircina* Jacq.** — Semishrub, twigs erect or ascendent from the base, poorly branched, without thorns, hirsute. **Seeds globose to cordiform or broad reniform, slight flattish, hilum sunken, elliptic to ovoid with a white hem, 2.3-2.9 x 2-2.5 mm. Surface dense tuberculate, dark-brown. 2n = 60, 64.** Native to Eurasia, on dryer meadows, pastures, roadsides and steppe slopes; throughout the Carpathians.

**1679. *Ononis pusilla* L., *O. columnae* All.** — Semishrub, up to 30 cm high, twigs without thorns, hirsute, woody at base, ascendent, unramified. **Seeds orbicular to reniform, slight flattish, hilum rounded, 1.5-2 x 1.3-1.7 mm. Surface fine tuberculate, ochre to olive-brown. 2n = 30.** Native to Eurasia, on sunny shrubby slopes, limestone ledges, roadsides. Hu, Ro, Sk, Uk.

**1680. *Ononis repens* L.** — Semishrub, stems procumbent up to ascendent, 30-70 cm high, woody at base, unarmed, soft-spiny. **Seeds globose to cordiform, slight flattish, hilum sunken, rounded, 2.2-2.6 x 2.2-2.8 mm. Surface regular dense tuberculate, dull, pale- to dark-brown. 2n = 60, 64.** An Eurasian element, common on roadsides, slopes and pastures; in all Carpathian territories.

**1681. *Ononis spinosa* L., *O. campestris* W. D. J. Koch et Ziz.** — Semishrub, 10-80 cm high, stems erect, spiny. **Seeds globose to broad reniform or cordiform, hilum sunken, rounded, 1.8-2.3 mm in diam. Surface faint regular tuberculate, rare smooth, reddish- or greyish-brown, to black, often marbled. 2n = 30.** An Eurasian element, dispersed in low- and uplands, on semi-dry turfs, roadside verges, meadows; throughout the Carpathians.

**1682. *Melilotus alba* Medik., *M. vulgaris* Willd.** — Annual to biennial, stems erect, branched, 30-150 cm high, hairy on the upper part. **Seeds reniform to elliptic, radicular lobe 2/3-3/4 of the length of the cotyledonary one, 1.8-2.2 x 1.2-1.5 mm. Surface smooth to indistinct tuberculate, light-buff to orange-brown. 2n = 16.** Native to Eurasia, in weedy places, on roadsides, stony waste lands, ditches, screes; throughout the Carpathians.

**1683. *Melilotus altissimus* Thull., *M. perfrondosus* Borbás ex O. E. Schulz** — Annual to perennial, stems

erect or ascendent from the base, 50-150 cm high, shortly branched, glabrous. **Fruits legumes (left), 1-seeded, ovoid, acuminate, 5-6 mm long. Surface black, protuberant trimmed. Seeds elliptic, radicular lobe c. 1/2-2/3 of the cotyledonary one, 2.2-2.8 x 1.5-2 mm. Surface moderate tuberculate, slight lustrous, light-brown to orange-brown, henna. 2n = 16.** Native to Eurasia, on moist and saline meadows, light lowland forests, coastal shrubberies, embankments; throughout the Carpathians.

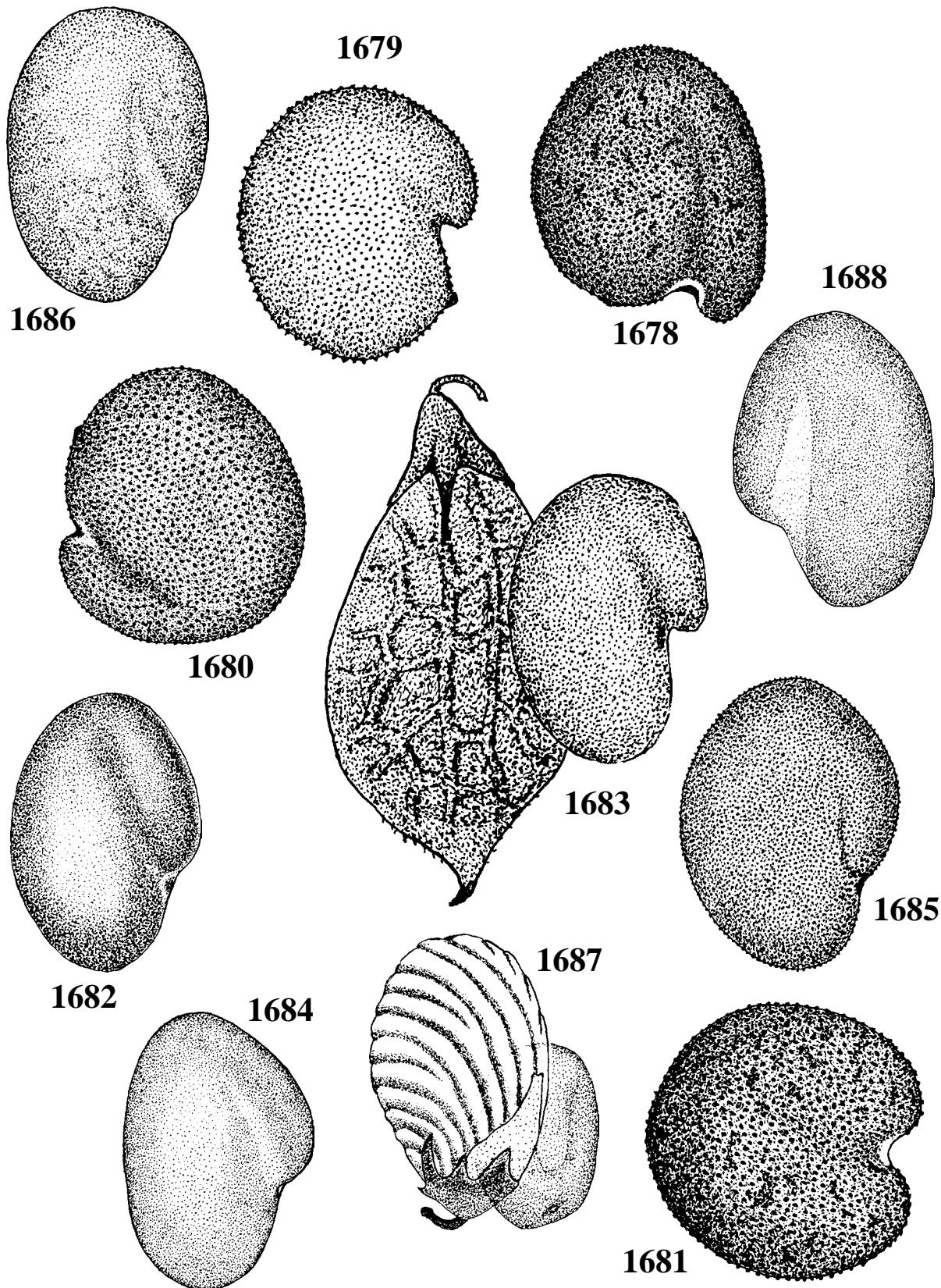
**1684. *Melilotus dentata* (Waldst. et Kit.) Pers.** — Biennial, stems ascendent or erect, 20-150 cm high, branched from the base, sometimes hairy above. **Seeds irregular-elliptic to obovoid, slight flattish, 2-2.5 x 1.4-1.6 mm. Surface smooth, dull, light-brown to orange-brown, henna. 2n = 16.** Native to Eurasia, in lowland saline meadows, steppes, riverbanks; in all Carpathian territories.

**1685. *Melilotus indica* (L.) All., *M. parviflorus* Desf., *Trifolium indicum* L.** — Annual, stems ascendent or erect, 15-50 cm, ramified. **Seeds elliptic to obovoid, slight flattish, 1.5-2 x 1.2-1.6 mm. Surface dense tuberculate, dull, pale-brown to henna. 2n = 16.** Native to eastern Mediterranean region and Asia Minor, in waste places, screes of warmer areas; sometimes hauling into the Carpathians. Sk.

**1686. *Melilotus officinalis* (L.) Pall., *Trifolium officinale* L.** — Biennial, stems erect, 40-200 cm high, ramified, angular, sometimes sparsely hairy. **Seeds elliptic to obovoid, radicular lobe 2/3-3/4 of the cotyledonary one, 1.5-2 x 1-1.3 mm. Surface smooth, dull or slight lustrous, yellow, yellowish-green to light-brown. 2n = 16.** Native to Eurasia, on verges, embankments, fallows, pastures in warmer areas; rarely grown as a medicinal plant and for green manuring. Hu, Mo, Pl, Ro, Sk, Uk.

**1687. *Melilotus sulcata* Desf.** — Annual, stems erect, 10-40 cm high, sometimes branched, shortly hairy above. **Fruits legumes, elipsoid to globose, 3-4 mm in diam. Surface characterized by the concentric folds. Seeds elliptic to obovoid, slight flattish, 2.5-3.5 x 1.7-2.3 mm. Surface dull, lustreless, brown to dark-brown. 2n = 16.** Originally growing in the Mediterranean, on dry stony and sandy soils in warmer stands; rarely hauling into the Carpathians.

**1688. *Melilotus taurica* (M. Bieb.) Ser.** — Biennial, stems erect or ascendent, branched, 30-80 cm high,



poorly pubescent. **Seeds elliptic to obovoid, slight flattish, 2-2.5 x 1.4-1.7 mm. Surface smooth, dull, greenish-yellow to light-brown.** Native to the Crimea, on dry hillsides and tilled grounds; rarely hauling into the Carpathians.

**1689. *Melilotus wolgica*** Poir — Annual to biennial, stems erect, branched, 50-150 cm high. **Seeds mitaform (length: width c. 2 : 1) prolonged ellipsoid, radicular lobe c. 2/3-3/4 of the cotyledonary one, 2.5-3 x 1.4-1.8 mm. Surface smooth, light-buff to orange-brown, spotted.** Native to the saline soils of the Ukraine and central Asia; from time to time hauling into the Carpathians.

**1690. *Trigonella coerulea*** (L.) Ser., *Trifolium caeruleum* L. — Annual, stems erect, 30-100 cm high, poorly ramified, bare, sparsely hairy. **Seeds elliptic, reniform or cordiform, flattish, radicular lobe a little longer than the cotyledonary one, 1.7-2.2 x 1.5-1.7 mm. Surface dull, slight lustrous, fine tuberculate, pale-brown to brown, old seeds dark-brown. 2n = 16.** Native to the eastern Mediterranean, in warmer areas of the Carpathians, on dry eutrophic soils; cultivated for fodder, casual as a weed.

**1691. *Trigonella foenum-graecum*** L., *Foenum-graecum officinale* Moench — Annual, stems erect, ascendent, 10-50 cm, with a characteristic smell. **Seeds rhomboid to angular-reniform, strong flattish, hilum sunken, rounded, 4-4.6 x 2.8-3.3 mm. Surface fine tuberculate, dull, often wrinkly, light-brown to brown. 2n = 16.** Native to southern Europe and western Asia; since ancient times cultivated as a medicinal plant, causal as a ruderal. Hu, Mo, Ro, Sk, Uk.

**1692. *Trigonella gladiata*** Stev. — Annual, stems 5-25 cm high, lateral twigs procumbent, whole plant hairy. **Seeds ovate to rhomboid, strong flattish, 3-3.5 x 2.3-2.7 mm. Surface dense and markedly tuberculate, olive to yellowish-brown. 2n = 16.** Native to the Mediterranean sunny rocks, stony slopes, tilled lands, vineyards. Hu, Ro, Uk.

**1693. *Trigonella monspeliaca*** L. — Annual, tiny, stems 5-30 cm high, branched, procumbent or erect, soft-hairy. **Seeds ovate to rhomboid, or irregular multilateral, hilum rounded, 1.3-1.6 x 0.7-1 mm. Surface verrucose, dull or slight lustrous, greyish-brown, greenish- to dark-brown. 2n = 16.** Native to the Mediterranean, stony slopes, scrubs, pine forests, fallow fields. Hu, Mo, Ro, Sk, Uk.

**1694. *Trigonella procumbens*** (Bess.) Rchb., *T. hesserana* Ser. — Annual, stems 30-80 cm high, ascendent or suberect, branched from the base. **Seeds elliptic, reniform or globose, slight flattish, hilum rounded, sunken, 1.7-2.2 x 1.4-1.7 mm. Surface fine tuberculate, dull, olive to olive- or greyish-brown. 2n = 16.** Native to Eurasia, on saline meadows and pastures, shrubberies, woody steppes. Hu, Mo, Ro, Sk, Uk.

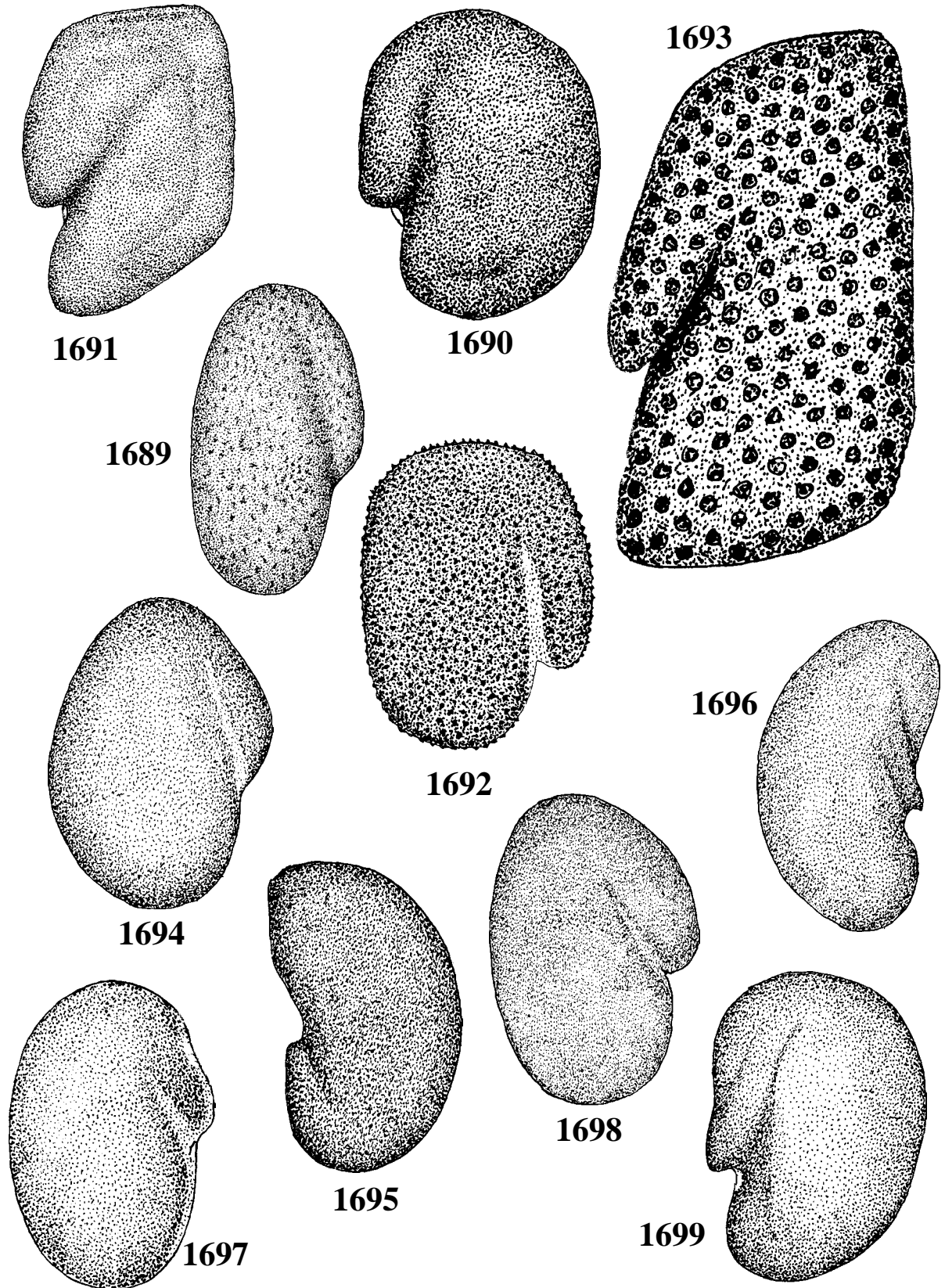
**1695. *Medicago aculeata*** Gaertn., *M. turbinata* Willd. non (L.) All. — Annual, stems procumbent, 20-70 cm high. **Seeds reniform, strong flattish, 4.7-5.3 x 2.7-3.2 mm. Surface dull or faint lustrous, light brown to reddish-brown. 2n = 16.** Native to southern Europe; occasionally hauling into the Carpathians.

**1696. *Medicago arabica*** (L.) Huds., *M. maculata* Sibth. — Annual, up to 50 cm high, sparsely hairy or bare, stems procumbent or ascendent, ramified. **Seeds reniform, strong flattish, tip of the radicular lobe created distinct beak, 2.6-3.1 x 1.4-1.8 mm. Surface smooth, faint lustrous, light-yellow to reddish-brown. 2n = 16.** Native to the Mediterranean moist slopes, road verges, along rivers and brooks; hauling into the Carpathians and naturalized. Hu, Ro.

**1697. *Medicago falcata*** L., *M. sativa* subsp. *falcata* (L.) Arcang. — Perennial, stems ascendent, 20-60 cm high. **Seeds broad elliptic to reniform or disproportional cordiform, slight flattish, radicular, 1.5-2 x 1-1.3 mm. Surface smooth, dull, light- to dark-brown. 2n = 16, 32.** Native to Eurasia, on dry and semi-dry turfs, roadside and forest verges, in calcareous and sandy soils; throughout the Carpathians.

**1698. *Medicago glandulosa*** Davidov — Perennial, stems procumbent or ascendent, 30-60 cm high, glandularly hairy. **Seeds elliptic to reniform or cordiform, flattish, radicular lobe about half of the cotyledonary one, 1.8-2.2 x 1.2-1.5 mm. Surface smooth, slight lustrous, yellowish- to pale-brown. 2n = 32.** Native to Eurasia, on southern mountain slopes, forest clearings. Sk (?).

**1699. *Medicago lupulina*** L., *Medicula lupulina* (L.) Medik. — Annual to perennial, tufted, stems branched, ascendent, downy. **Seeds obovate to elliptic or reniform, radicular lobe 2/3 of the cotyledonary one, 1.5-2 x 1.2-1.5 mm. Surface smooth, slight lustrous or dull, yellow, yellowish-green to brown. 2n =**





**16, 32.** Native to Eurasia and northern Africa, on semidry turfs, meadows, roadsides verges, embankments, growing in soils rich in nutrients; in all Carpathian territories.

**1700. *Medicago marina*** L. — Perennial, stems 20-40 cm high, procumbent or ascendent, ramified, dense whitish hirsute. **Seeds reniform, slight flattish, dorsal side convex, ventral concave with a roundish hilum, 3-3.4 x 1.8-2 mm. Surface smooth, dull or slight lustrous, deep-yellow.** Native to the area of the Mediterranean as far as Asia Minor, in sandy sea shores. Ro.

**1701. *Medicago minima*** L., *M. mollissima* Roth — Annual, dense villous, stems 10-40 cm high, tufted, ramified, procumbent or ascendent. **Seeds reniform to falcate, tip of the radicular lobe forming a distinct beak, represented half of the cotyledonary one, 1.8-2.2 x 1.1-1.4 mm. Surface smooth, dull or slight lustrous, yellow to sandy-yellow. 2n = 16.** Native to Eurasia in stony and sandy places, weed in crop fields, steppes, sand dunes. Hu, Pl, Mo, Ro, Sk, Uk.

**1702. *Medicago nigra*** (L.) Krockner, *M. denticulata* Willd. — Annual, glabrous or downy, up to 40 cm high, stems procumbent or ascendent, angular. **Seeds elliptic to reniform, slight flattish, radicular lobe c. half of the cotyledonary one, hilum sunken, rounded, 2.6-3.8 x 1.9-2.2 mm. Surface dull or faint lustrous, yellowish-brown. 2n = 14, 16.** Native to the Mediterranean, in lowlands with dry loamy soils rich in nutrients, railway embankments. Ro.

**1703. *Medicago orbicularis*** (L.) Bartal. — Annual, glabrous or sparsely hairy, stems procumbent and ascendent, 20-90 cm high. **Seeds obovoid, trigonous, flattish radicle about as long as cotyledons, 2.2-2.8 x 2.2-2.5 mm. Surface tuberculate, dull, lustreless, yellowish-brown to dark-brown. 2n = 16.** Native to southern Europe, on heavy soils, rocky slopes, cultivated and fallow fields; rarely hauling into the Carpathians. Ro.

**1704. *Medicago polymorpha*** L., — Annual, glabrous or pubescent, stems up to 40 cm high, leaflets obovate or obcordate, dentate near the apex. **Seeds ellipsoid or reniform, lateral compressed, radicular lobe shorter than half of the cotyledonary one, 2.7-3.1 x 1.5-1.8 mm. Surface smooth, slight lustrous, yellow. 2n = 14, 16.** Native to Eurasia, Africa; on dry slopes,

vineyards, waste places, road margins; rarely hauling into the Carpathians from the Mediterranean. Ro.

**1705. *Medicago prostrata*** Jacq., *M. tenuis* Kit. — Perennial, stems procumbent or ascendent, slender, angular, poorly branched, 10-40 cm high. **Seeds elliptic to reniform, flattish, radicular lobe as long as the cotyledonary one, 2-2.5 x 1.2-1.5 mm. Surface glabrous or dispersed verrucose, dull or slight lustrous, sandy-, greyish- to dark-brown. 2n = 32.** Native to southern Europe (from Italy up to the Black Sea) on rocks, rocky steppes, dry meadows, from lowland to subalpine zones. Hu, Ro, Sk.

**1706. *Medicago rigidula*** (L.) All., *M. gerardii* Waldst. et Kit. ex Willd. — Annual to biennial, tufted, stems 10-40 cm high, procumbent to ascendent, branched, hairy. **Seeds elliptic to reniform, flattish, radicle faint distinct, up to half of the cotyledons, hilum distinct, rounded, 3.2-4 x 1.6-2.3 mm. Surface smooth or slight pitted, lustrous, yellow to brown. 2n = 14, 16.** Native to the Mediterranean, in cultured land, vineyards, on walls and roadsides. Mo, Ro, Sk, Uk.

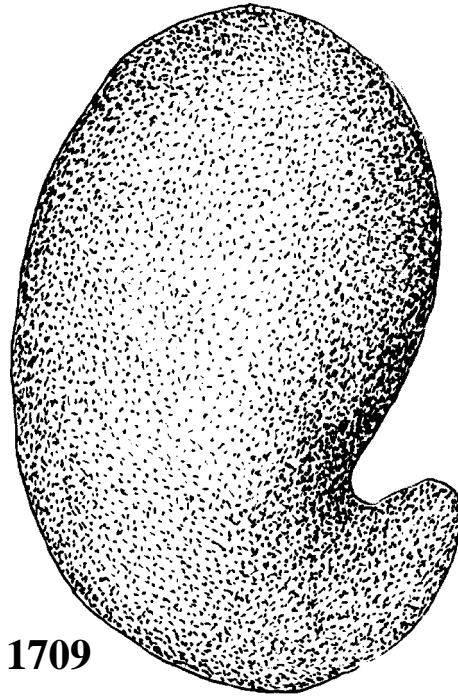
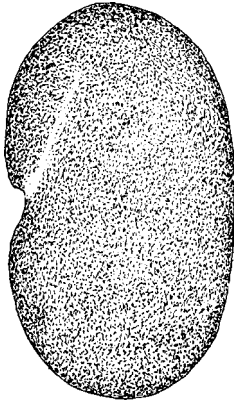
**1707. *Medicago romanica*** Prodan, *M. falcata* var. *romanica* (Prodan) Hayek — Perennial, stems ascending or prostrate, 30-70 cm, leaves oblong-linear, 4-16 m long, pubescent above. **Seeds ± ellipsoid or reniform, lateral compressed, radicle shorter than the cotyledons, 2-2.4 x 1.1-1.4 mm. Surface smooth, faint lustrous, yellowish to pale-brown. 2n = 16.** Native to Eurasia, on stony and grassy slopes, in steppes and wood steppes. Mo, Ro, Uk.

**1708. *Medicago sativa*** L., *M. subfalcata* Schur — Perennial, stems erect, 30-90 cm high, bare, rhizome woody. **Seeds shaped variable, mostly prolonged-elliptic to reniform, straight or faint crooked, bean formed, slight flattish, radicle length half of the cotyledons, 2.2-2.8 x 1.2-1.5 mm. Surface smooth, dull or slight lustrous, yellow to green-yellow, old seeds brown. 2n = 32.** A plant of unknown origin cultivated since ancient times; commonly grown for fodder in many cvs.

**1709. *Medicago scutellata*** (L.) Mill. — Perennial, glandular hirsute, stems 15-40 cm high, legumes from one side flattish, from another convex. **Seeds reniform, with distinct crooked radicle, 5.2-5.8 x 3.4-3.7 mm. Surface glabrous, lustreless or faint**

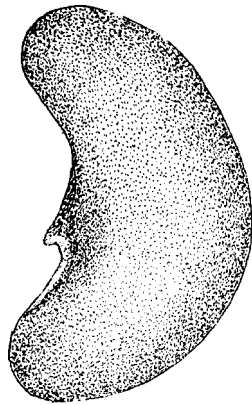
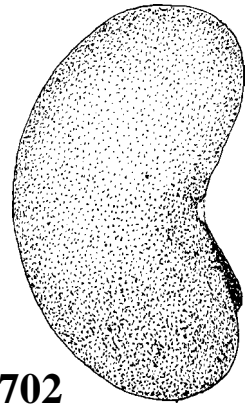


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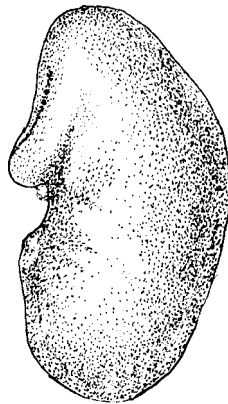
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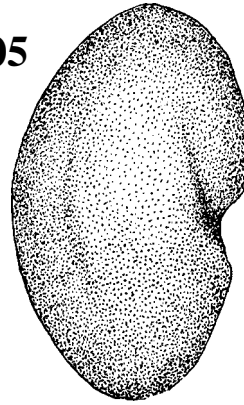


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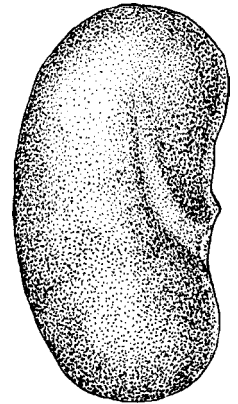
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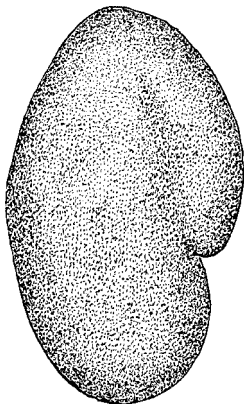
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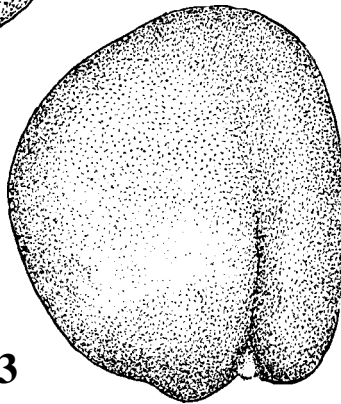
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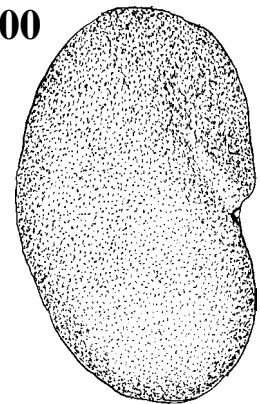
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lustrous, yellow, pale-brown later on. Native to eastern Europe, on weedy and waste places, forest steppes. Uk.

**1710. *Medicago x varia*** Martyn, *M. x media* Pers. — Hybrid *M. falcata* x *sativa*, appears everywhere, where these two species are growing close together. **Seeds reniform, lateral compressed, 2-2.7 x 1.3-1.5 mm. Surface smooth, faint lustrous, yellowish, yellowish-brown later on. 2n = 32 (138).** Abundant in warmer localities.

**1711. *Trifolium alexandrinum*** L. — Annual, stems 40-70 cm high, erect, branched, hairy. **Seeds broad ellipsoid to ovoid, hilum rounded, white, 2-2.5 x 1.5-1.8 mm. Surface smooth, slight lustrous, yellow- to pale- or dark-brown. 2n = 16.** Originally growing in the Mediterranean region and Egypt, on fields and shady fallows; widely cultivated in the warmer areas of southern Europe; frequently escaping and temporarily naturalized in the Carpathians.

**1712. *Trifolium alpestre*** L. — Perennial, stems erect or ascendent, 15-40 cm, unbranched, hairy. **Seeds asymmetric cordiform to ovoid, 1.6-2 x 1.3-1.7 mm. Surface dull, smooth, light-yellow, green-yellow, to medium-buff (when fresh), to henna (old seeds). 2n = 16 (20).** Native to the European lowland to mountain zones, in shrubs, dry sandy pine forests; ornamental species cultivated in parks and gardens throughout the Carpathians.

**1713. *Trifolium ambiguum*** M. Bieb. — Perennial, plant 10-40 cm high, glabrous, ascendent,  $\pm$  branched. **Seeds ellipsoid, asymmetric reniform, slight flattish, hilum rounded, 1-1.5 x 0.9-1.3 mm. Surface smooth, dull, yellowish- to dark-brown.** Native to the Asia Minor, Crimea, Caucasus, on moist forest meadows, saline soils; rarely hauling into the East Carpathians. Mo, Ro, Uk.

**1714. *Trifolium angulatum*** Waldst. et Kit., *Amoria angulata* (Waldst. et Kit.) C. Presl — Annual, glabrous, stems ascendent to erect, hollow. **Seeds ellipsoid, cordiform to spheroid, slight flattish, 1.2-1.7 x 0.7-0.9 mm. Surface faint verrucose, dull or slight lustrous, sandy-brown, greenish-yellow, seldom spotted. 2n = 16.** Endemic to the Mediterranean, Balkan Peninsula, Caucasus and southwestern Africa, on pastures, meadows and fallows. Hu, Ro, Sk, Uk.

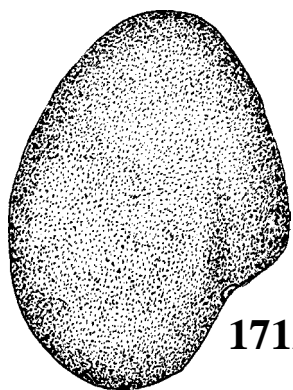
**1715. *Trifolium angustifolium*** L. — Annual, stems 10-50 cm high, hairy, with lateral ascendent, short twigs. **Seeds elliptic to ovoid, slight flattish, hilum rounded, 1.8-2.2 x 1.2-1.5 mm. Surface smooth, glossy light-brown to orange-brown. 2n = 16.** Originally growing in southern Europe, in dry grassy places, light forests and shrubberies, a calcifuge, up to elevation 700 m. Br, Ro, Sk, Uk.

**1716. *Trifolium arvense*** L. — Annual to biennial, stems 5-40 cm high, erect,  $\pm$  branched, downy, reddish. **Seeds elliptic to asymmetric reniform, radicular lobe 2/3 of the cotyledonary one, 1-1.4 x 0.6-0.9 mm. Surface dull or lustrous, smooth, light green-yellow, medium yellow-green (fresh seeds) or orange-brown (old seeds). 2n = 14.** Native to Euro-Siberia, in dry calcifugous grassy and waste places, open communities, up to elevation of 2300 m; throughout the Carpathians.

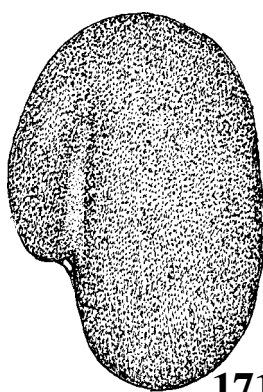
**1717. *Trifolium aureum*** Pollich, *Chrysaspis aurea* (Pollich) Greene, *T. strepens* Crantz — Annual, stems 10-40 cm high, numerous, ramified, hirsute. **Seeds asymmetric-cordiform, ovoid to spherical, slight flattish, 1.1-1.4 x 0.8-1 mm. Surface smooth, slight lustrous or dull, yellowish-brown. 2n = 14.** Native to Europe and western Asia, in thickets, wood margins and clearings, pastures, grassy slopes, embankments; throughout the Carpathians.

**1718. *Trifolium badium*** Schreb., *Chrysaspis badia* (Schreb.) Greene — Perennial, stems ascendent, tufted, 10-25 cm, hirsute or glabrous. **Seeds ovoid, asymmetric-cordiform, medium-flattish, 1.6-2.2 x 1.1-1.6 mm. Surface glabrous, dull or slight lustrous, yellowish-brown, mostly greenish in the upper part. 2n = 14.** Native to the mountains of central and southern Europe, in subalpine and alpine zones, on meadows, snow deck-chairs, rocky and stony slopes. Pl, Ro, Sk, Uk.

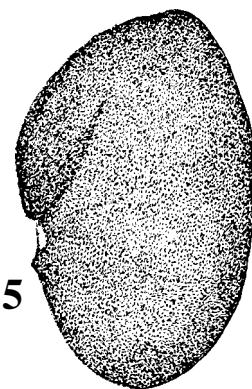
**1719. *Trifolium campestre*** Schreb., *Chrysaspis campestris* (Schreb.) Desv. — Annual, stems 30-50 cm high, erect or ascendent, hirsute, poorly branched. **Seeds narrow ovoid, medium-flattish, radicle distinct demarcate from cotyledons, 1-1.2 x 0.6-0.8 mm. Surface slight lustrous, smooth, yellow to yellowish-brown, mostly pale-greenish in the upper part. 2n = 14.** Native to whole Europe and western Asia, in dry, gassy and waste places, fallows, up to elevation 2000 m; throughout the Carpathians.



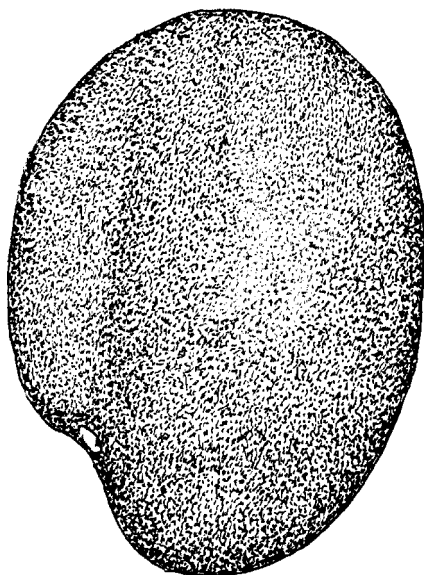
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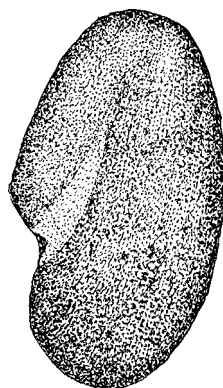
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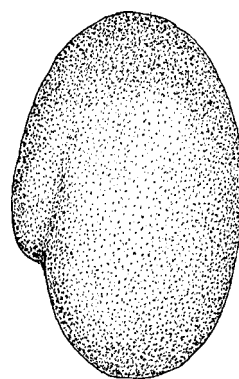
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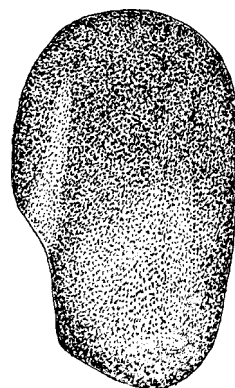
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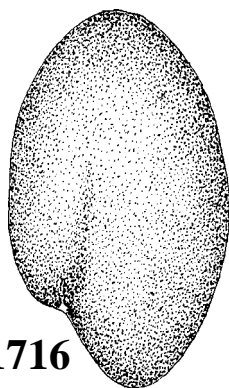
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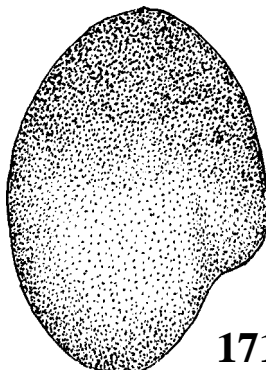
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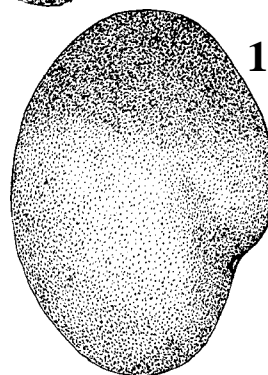
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**1720. *Trifolium diffusum*** Ehrh. — Annual, stems erect, 15-60 cm high, branched with long twigs. **Seeds mostly cordiform or prolonged reniform, slight flattish, radicle nearly as long as cotyledons, 1.3-1.7 x 1.2-1.5 mm. Surface smooth, slight lustrous, olive-yellow to pink-brown.  $2n = 16$ .** Native to the Eurasian forests, clearings, meadows, damp or shady grassy places, 700-1750 m elevation. Hu, Mo, Ro, Sk, Uk.

**1721. *Trifolium dubium*** Sibth., *Chrysaspis dubia* (Sibth.) Desv., *T. minus* Sm. — Annual, minute, glabrous, hirsute above, stems procumbent or ascendent, 5-50 cm high, crooked, branched. **Seeds elliptic or asymmetric cordiform, slight flattish, hilum round, 0.9-1.2 x 0.6-0.8 mm. Surface slight or medium-lustrous, greenish-yellow to yellowish-brown, hilum lighten than testa.  $2n = 28, 32$ .** Native to western Europe, in dry grassy and sandy places, at edges of pastures; in all Carpathian territories.

**1722. *Trifolium echinatum*** M. Bieb., *T. supinum* Savi — Annual, stems 20-60 cm high, erect or procumbent, branched at base. **Seeds asymmetric cordiform to globose or ovoid, 1-1.5 x 0.9-1.2 mm. Surface smooth, lustrous to glossy, unicoloured olive or yellowish, some seeds violetish-spotted.  $2n = 16$ .** Native mainly to the eastern Mediterranean and contiguous Euro-Siberian regions, in heavy soils, at field edges. Ro, Uk.

**1723. *Trifolium fragiferum*** L., *Galearia fragifera* (L.) C. Presl — Perennial, stems procumbent, 10-30 cm high, rooting on knots, seldom tufted. **Seeds prolonged cordi- or reniform, radicular lobe as long as or longer than the cotyledonary one, 1.3-1.7 x 1.1-1.4 mm. Surface dull, smooth, yolk-yellow to dark-yellow (when fresh) to henna (old seeds), sometimes sparse dark-brown spotted.  $2n = 16$ .** Native to southern Europe, on damp and wet saline pastures, fallows, roads and boundaries; throughout the Carpathians.

**1724. *Trifolium haynaldii*** Mengh. — Perennial, stems 20-45 cm high, ascending, usually branched, often reddish, scarcely appressed hirsute up to bare. **Seeds triangular, lateral slight compressed, 1.9-2.3 x 1.5-1.7 mm. Surface glabrous, slight lustrous, yellowish or light-brown.  $2n = 64$ .** Native to central Europe, in warmer deciduous woods, on stony slopes, pastures, boundaries from uplands up to montane zones. Pl, Ro, Sk.

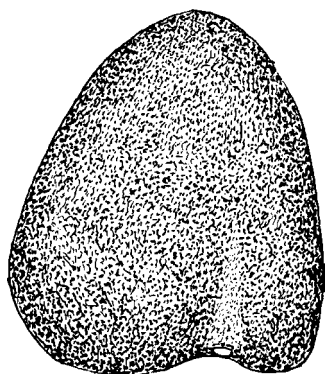
**1725. *Trifolium hybridum*** L., *T. elegans* Savi, *Amoria hybrida* (L.) C. Presl — Perennial, glabrous or glabrescent, stems erect or ascendent, 20-80 cm, poorly branched. **Seeds cordi- to reniform or triangular, slight flattish, 1.2-1.5 x 0.9-1.2 mm. Surface dull, smooth to indistinct and sparse tuberculate, greenish, olive, pink-brown to blackish-brown, usually copious spotted or without spots.  $2n = 16$ .** Euro-Siberian element, in temperate regions, on meadows, damp places; probably in all Carpathian territories.

**1726. *Trifolium incarnatum*** L. — Annual, stems 20-50 cm, simple, erect or ascendent, hairy. **Seeds elliptic to ovoid, slight flattish, radicular lobe 1/2-2/3 of the cotyledonary one, 2-2.5 x 1.3-1.7 mm. Surface glossy, smooth, yolk-yellow to orange-brown, henna (old seeds).  $2n = 14$ .** Originally growing in southwestern Europe, at edges of fields, meadows, roads; in the last years rarely cultivated as fodder. Hu, Mo, Pl, Ro, Sk, Uk.

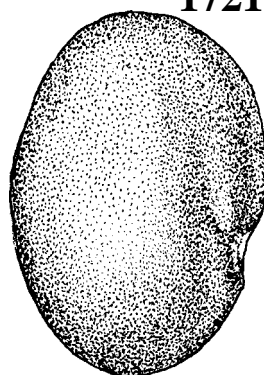
**1727. *Trifolium lappaceum*** L. — Annual, stems 10-40 cm high, single or ramified, erect or ascendent, bare or scarcely hirsute. **Seeds ovoid, slight flattish, dorsal side rounded, ventral with hilum, 1.2-1.4 x 1-1.2 mm. Surface smooth, slight lustrous, brownish- or purplish-brown.  $2n = 16$ .** Native to the regions from the Mediterranean as far as Iran, on upland hills, grassy vegetation; occasionally hauling into the Carpathians.

**1728. *Trifolium lupinaster*** L., *Lupinaster pentaphyllus* Moench — Perennial, stems 15-50 cm, erect or ascendent, bare. **Seeds prolonged asymmetrical cordi- or reniform, medium-flattish, 1.7-2.1 x 1.4-1.8 mm. Surface faint tuberculate, dull, greenish-grey to violet-brown.  $2n = 14$ .** Native to Eurasia, on dryer meadows and pastures, boundaries and fallows, in warmer areas; in the whole Carpathians, rare.

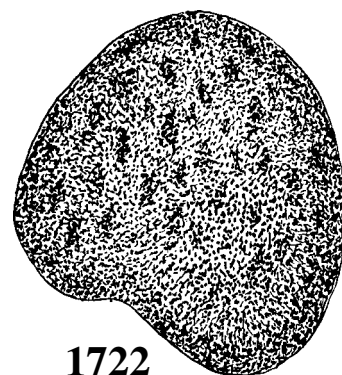
**1729. *Trifolium medium*** L., *T. flexuosum* Jacq. — Perennial, stems tufted, ascendent, ramified, hairy to bare. **Seeds asymmetrical cordi- or reniform, medium flattish, 1.9-2.3 x 1.5-1.7 mm. Surface dull or slight lustrous, yellow, sandy-yellow to brown or olive-green.  $2n = 70, 76, 78, 80$ .** In all warmer parts of the Carpathians, in woodlands, scrubs, poor pastures; quite abundant locally cultivated for fodder.



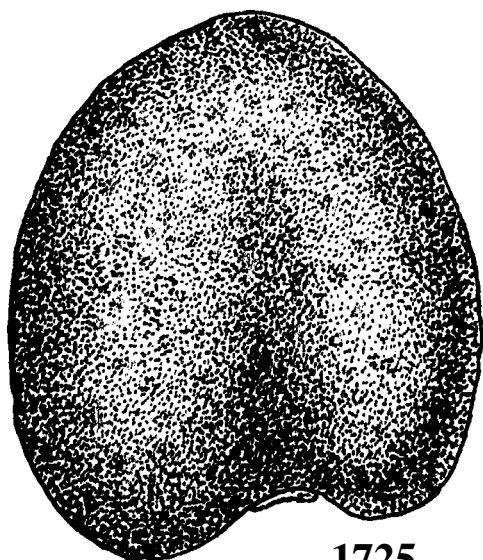
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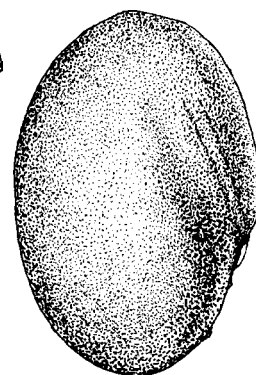
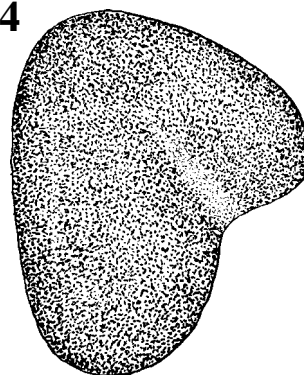


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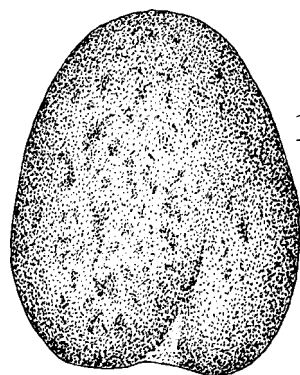


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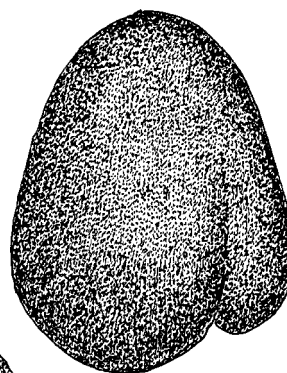
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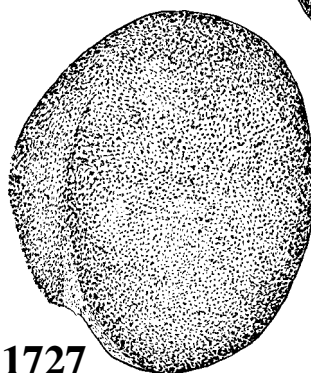
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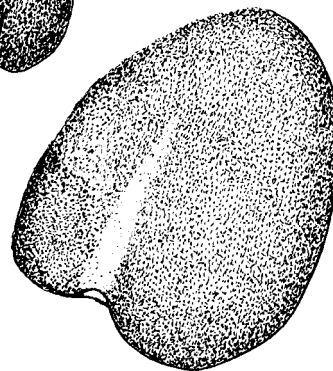
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**1730. *Trifolium michelianum*** Savi — Perennial, stems erect, 20-60 cm high, glabrous, striate, ramified. **Seeds ovoid or obovoid, lenticular, compressed, with distinct radicle, 1.4-1.6 x 1.1-1.3 mm. Surface smooth, lustrous, yellowish- or reddish-brown.  $2n = 16$ .** Native to the Mediterranean, on moist hay-meadows and by standing waters. Ro.

**1731. *Trifolium montanum*** L., *Amoria montana* (L.) Soják — Perennial, stems tufted, erect, 15-60 cm,  $\pm$  unbranched, poorly leafy, woolly. **Seeds elliptic or reniform to narrow ovate, medium-flattish, 1.2-1.7 x 0.8-1 mm. Surface lustrous or glossy, smooth, yolk-yellow to buff-brown and rusty-brown (old seeds).  $2n = 16$ .** Native to most of Europe and western Siberia, on grassy downs and pastures, light forests and shrubberies; in all Carpathian territories.

**1732. *Trifolium ochroleucon*** Huds. — Perennial, stems ascendent, 20-50 cm, unramified, hairy. **Seeds ovoid to reniform or oval, medium-flattish, hilum rounded, 1.7-2.2 x 1.2-1.6 mm. Surface smooth, dull or faint lustrous, sandy-yellow to brown.  $2n = 16$ .** Native to Europe and western Asia, in grassy, damp places in shade, roadsides, 400-2000 m elevation. Hu, Mo, Pl, Ro, Sk, Uk.

**1733. *Trifolium ornithopodioides*** L. — Annual, stems numerous, short, procumbent, 10-20 cm high, glabrous, leafy. **Seeds asymmetrical cordiform to ovoid, slight flattish, 1.2-1.5 x 1-1.2 mm. Surface smooth, slight lustrous, unicoloured yellow to brown, or blackish-spotted.  $2n = 16$ .** Native to southwestern Europe, occasionally hauling with wool. Hu, Ro.

**1734. *Trifolium pallescens*** Schreb. — Perennial, stems numerous, short, glabrous, procumbent or erect, 5-20 cm high. **Seeds reni- or cordiform, slight flattish, radicle little shorter than cotyledons, 1.1-1.4 x 1-1.3 mm. Surface dull, lustreless, waxy yellow.  $2n = 16$ .** Native to central and southern Europe, in alpine rarely, also subalpine zones, on calcifugous stands, damp screes and pastures above 1800 m elevation. Ro.

**1735. *Trifolium pallidum*** Waldst. et Kit., *T. borys-thenicum* Gruner — Annual to biennial, stems tufted, procumbent to ascendent, hairy, much-branched, 15-50 cm high. **Seeds asymmetrical cordiform to elliptic, slight flattish, hilum distinct, rounded, 1.5-2 x 1.3-1.8 mm. Surface light-brown to dark violet-brown.** Native to southeastern European

lowlands and uplands, in light dry stands, meadows, grassy and shrubby slopes; occasionally hauling into the Carpathian territories.

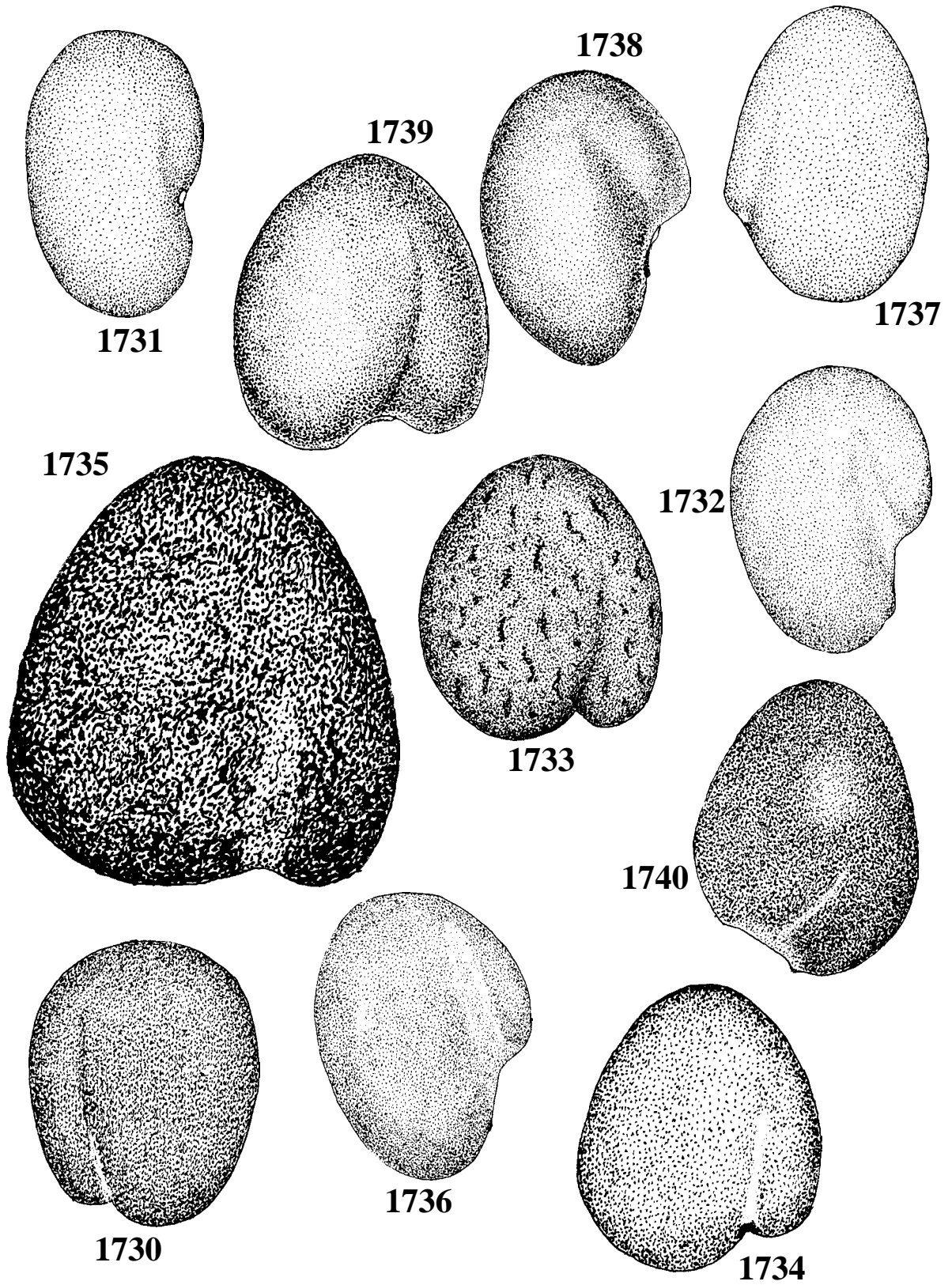
**1736. *Trifolium pannonicum*** Jacq. — Perennial, poorly tufted, stems erect, 20-100 cm, hairy. **Seeds ovoid to asymmetrical reniform or cordiform, hilum rounded, lighter than testa, 2-2.6 x 1.8-2.2 mm. Surface smooth, dull to slight lustrous, light-yellow to sandy-brown.  $2n = 126, 128, 130, 180$ .** An European element of lowlands and uplands, on dry stands, meadows, shrubby slopes. H, Mo, Pl, Ro, Sk, Uk.

**1737. *Trifolium patens*** Schreb., *Chrysaspis patens* (Schreb.) Holub — Annual, sparsely hirsute, stems slender, erect or ascendent, 20-50 cm high, poorly ramified. **Seeds ovoid or ellipsoid, non-flattish or only very slight, hilum rounded, 1-1.3 x 0.8-1 mm. Surface smooth, medium-lustrous, yellow or pale-brown (older seeds).  $2n = 14$ .** Native to central and southern Europe, on meadows, moist grasslands of warmer areas. Hu, Pl, Ro, Sk.

**1738. *Trifolium pratense*** L. — Perennial, tufted,  $\pm$  hairy, stems erect or ascendent, branched, 20-100 cm high, angular. **Seeds elliptic-ovoid, asymmetrical cordiform or reniform, medium-flattish, 1.7-2.3 x 1.2-1.5 mm. Surface slight lustrous to dull, yellowish-green, yellow to sandy-brown up to violet.  $2n = 14$ .** Native to Europe and adjacent parts of Asia and Africa, on meadows, pastures, an important fodder plant, grown in many cultivars; in all Carpathian territories.

**1739. *Trifolium repens*** L., *Amoria repens* (L.) C. Presl — Perennial, glabrous, hairless, stems creeping, rooting and ascendent. **Seeds cordi- or reniform, with a little shorter radicle than the cotyledons, 1.1-1.5 x 0.9-1.2 mm. Surface lustrous, smooth, yolk-yellow to orange (fresh seeds) or henna (old seeds).  $2n = 32$ .** An Euro-Siberian element, in grassy places, lowland forests, coastal shrubberies, moist fields and gardens; throughout the Carpathians.

**1740. *Trifolium resupinatum*** L., *Galearia resupinata* (L.) C. Presl — Annual up to biennial, stems 10-60 cm high, decumbent or ascending,  $\pm$  ramified, glabrous. **Seeds ovoid, elliptic to asymmetrical cordiform, medium-flattish, 1.3-1.8 x 0.9-1.3 mm. Surface smooth, dull or slight lustrous, deep-yellow, sandy brown, brown, violet to black.  $2n = 16$ .** Native to southern Europe and Asia



Minor, in wastelands, roadsides verges, saline soils; frequently introduced in the Carpathians. Hu, Ro, Sk, Uk.

**1741. *Trifolium retusum* L., *T. parviflorum* Ehrh.** — Annual, stems numerous, procumbent or ascending, branched, 8-30 cm high, flowers white or greenish, small. **Seeds  $\pm$  reniform or broad ovoid, radicle thin, as long as cotyledons, 0.9-1.1 x 0.8-1 mm. Surface smooth, lustreless, yellow- or pale-brown.  $2n = 16$ .** Native to Eurasia, on dry meadows, pastures, fallows, boundaries, in saline, non-calcareous stands. Hu, Mo, Ro, Sk, Uk.

**1742. *Trifolium rubens* L.** — Perennial, stems bare, erect, unbranched, 30-60 cm high. **Seeds ovoid, spheroid up to asymmetrical cordiform, medium-flattish, 1.7-2.3 x 1.4-1.8 mm. Surface smooth, dull to slight lustrous, sandy-yellow to violet-brown, unicoloured or with dark spots.  $2n = 16$ .** Native to central Europe, from lowland to mountain deciduous forests, shrubs, sunny slopes; throughout the Carpathians.

**1743. *Trifolium sarosiense* Hazsl., *T. medium* subsp. *sarosiense* (Hazsl.) Simonk.** — Perennial, stems procumbent or ascendent, 20-60 cm high, appressed hairy or bare above, rough. **Seeds asymmetrical cordiform, medium-flattish, hilum sunken, rounded, 2.2-2.5 x 1.7-2 mm. Surface smooth, dull to slight lustrous, hilum greyish-green, sandy-brown to yellow-green.  $2n = 48$ .** Native to the foothills of the Carpathians, in light forests and their margins, steppe meadows. Hu, Sk.

**1744. *Trifolium sativum* (Schreb.) Crome, *T. pratense* subsp. *sativum* (Schreb.) Schübl.** — Perennial, stems 40-100 cm high,  $\pm$  erect, glabrous, hollow, leaves large, leaflets up to 5 mm long, flowers red or deep-pink. **Seeds reniform or obovoid, lateral slight compressed, 2-2.5 x 1.4-1.6 mm. Surface smooth, lustrous, yellow, pale-brown later on.  $2n = 14$ .** Native to Europe, cultivated as a fodder plant in the past, often naturalized along roads, on meadows and pastures.

**1745. *Trifolium scabrum* L.** — Annual, stems 8-30 cm high, prostrate,  $\pm$  branched. **Seeds elliptic to oval or asymmetrical reniform, radicle little longer than half of cotyledons, 1.4-1.8 x 1-1.2 mm. Surface smooth, lustrous to glossy, yellow to orange.  $2n = 10$ .** An Mediterranean and western Asian

element, in scrubs, calcareous grasslands, stony grounds, rock crevices. Ro.

**1746. *Trifolium spadiceum* L., *Chrysaspis spadicea* (L.) Greene** — Annual to biennial, glabrous, dispersely hirsute above, stems erect, 20-40 cm high, ramified. **Seeds ellipsoid to asymmetrical cordiform, slight flattish, hilum rounded, 1.2-1.5 x 0.9-1.1 mm. Surface smooth, dull or slight lustrous, yellow, slight olive-greenish in the upper part.  $2n = 14$ .** Native to northern, central, southern Europe and Siberia, in forest and mountain meadows, calcifuge grassy places. Mo, Pl, Ro, Sk, Uk.

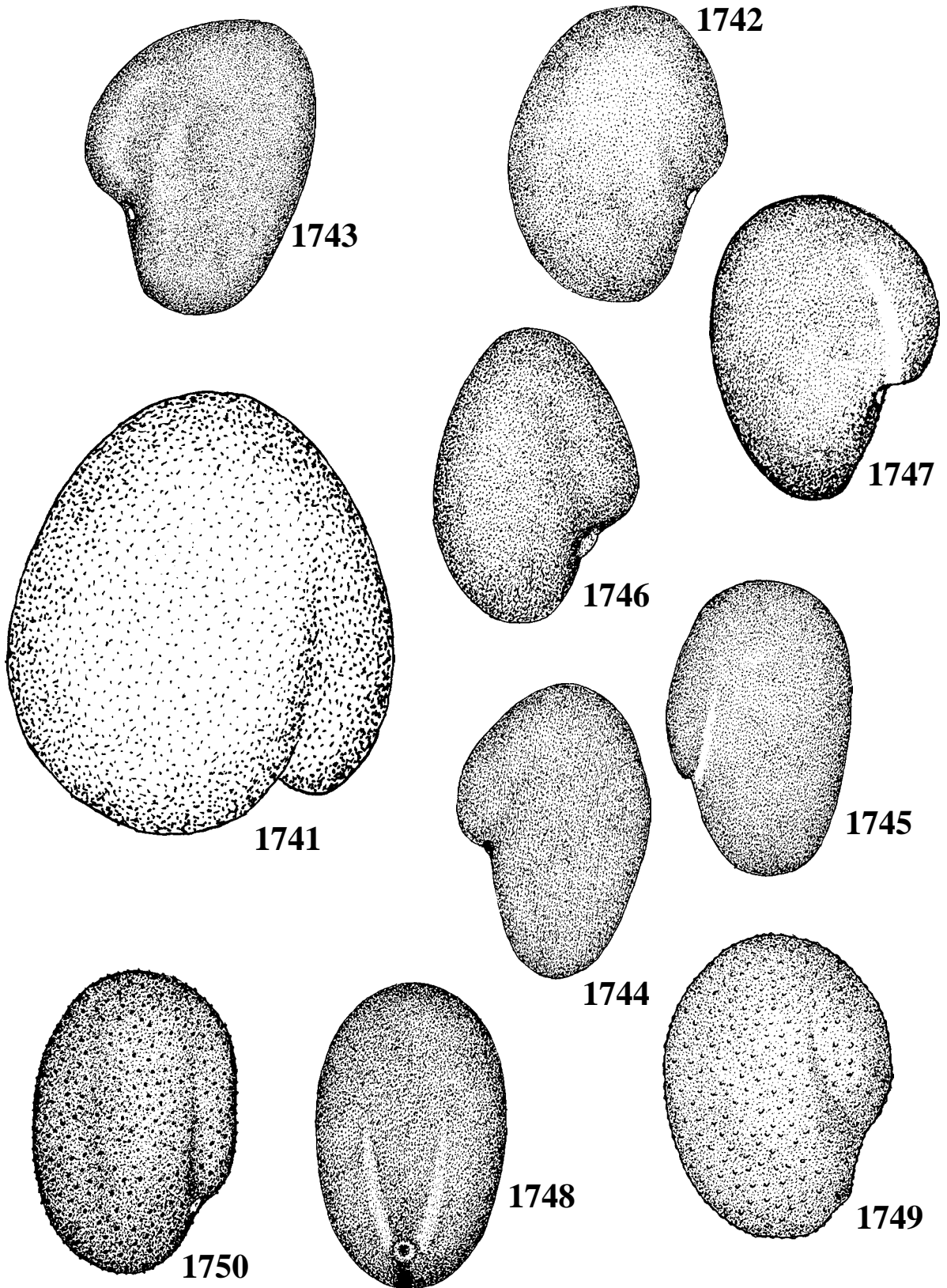
**1747. *Trifolium squamosum* L., *T. maritimum* Huds.** — Annual, stems procumbent or ascendent, 10-40 cm, hairy or glabrous, ramified. **Seeds ovate to elliptic slight flattish, hilum rounded, 2.2-2.6 x 1.7-2 mm. Surface smooth, slight flattish, yellow to brown.** Native to western Europe, the Mediterranean area and southeastern Asia, in damp grassy places, especially near the seas. Ro, Uk.

**1748. *Trifolium squarrosum* L.** — Annual, robust, 20-80 cm high, stems erect or ascendent, hairy or bare. **Seeds elliptic, transversal section mostly circular, 2.5-3 x 1.6-2 mm. Surface smooth, dull or slight lustrous, yellow to pale-brown.  $2n = 14$ .** Native to southern Europe, in grassy places; occasionally hauling into the Carpathian territories.

**1749. *Trifolium striatum* L.** — Annual, softly hairy, stems 5-40 cm high, procumbent to ascendent, loosely branched. **Seeds broad elliptic up to globose, not or only slight flattish, radicular lobe 2/3 of the cotyledonary one, 1.6-2.2 x 1.4-1.8 mm. Surface dull, faint verrucose, ridges low and indistinct, yolk-yellow or rusty-brown (old seeds).  $2n = 14$ .** Native to western Europe and the Mediterranean, on saline pastures, waste places, sandy and stony slopes. Hu, Mo, Pl, Ro, Sk, Uk.

**1750. *Trifolium strictum* L., *T. laevigatum* Poir.** — Annual, bare, stems erect or ascendent, 5-26 cm high, poorly branched. **Seeds asymmetric narrow cordiform or reniform, slight flattish, 1.2-1.7 x 0.8-1.1 mm. Surface faint reticulate, dull or slight lustrous, sandy-yellow to pinkish- or greenish-brown.** Native to the Mediterranean, on calcifuge grasslands, in inland saline soils. Hu, Ro, Sk.





**1751. *Trifolium subterraneum* L.** — Annual, stems procumbent, numerous, 10-30 cm long. **Seeds prolonged cordiform, radicle approximate as long as cotyledons, 3.2-3.8 x 2.4-2.8 mm. Surface smooth, slight lustrous, black. 2n = 16.** Originally growing in southern Europe and Asia, in dry places, often in sandy soils, fallow fields; occasionally, hauling, mostly with wool, into the Carpathians. Hu, Ro, Uk.

**1752. *Trifolium suffocatum* L.** — Annual or perennial, tufted, stems 2-10 cm high, bare, scarcely ramified, procumbent. **Seeds lenticular, slight flattish, radicular lobe scarce distinct, 0.8-1 x 0.7-0.9 mm. Surface smooth, mostly dull, yellow, pale- to dark-brown.** Native to the regions of the Mediterranean up to Asia Minor, on maritime sands, pasture, ways, in sunny, dry places. Ro.

**1753. *Trifolium tomentosum* L., *Xerosphaera tomentosa* (L.) Soják** — Annual, caespitose, stems up to 15 cm, procumbent. **Seeds reniform, slight compressed, radicle a little longer than cotyledons, 1.1-1.3 x 0.9-1 mm. Surface glabrous, slight lustrous, yellow, greenish-yellow or reddish-brown. 2n = 16.** Native to southern Europe, on dry places; rarely hauling, mostly with wool, into the Carpathians.

**1754. *Trifolium vesiculosum* Savi, *T. recurvum* Waldst. et Kit.** — Annual, stems 15-60 cm high, rigid, glabrous, angular, simple or branched, erect or ascendent. **Seeds prolonged ellipsoid to asymmetric-cordiform, slight flattish, 1.5-1.7 x 1.2-1.3 mm. Surface dull or slight lustrous, orange, reddish-brown, unicoloured.** Native to southern Europe, in dry, grassy places. Hu, Mo, Ro, Uk.

**1755. *Dorycnium germanicum* (Gremli) Rikli, *D. pentaphyllum* subsp. *germanicum* (Gremli) Gams, *D. sericeum* (Neilr.) Borbás** — Perennial or semishrub, ascendent or erect, 10-50 cm high. **Seeds ellipsoid or ovoid, slight flattish, hilum elliptic, distinct, 1.8-2.2 x 1.4-1.6 mm. Surface smooth, lustrous, olive-green or grey-brown, spotted or unicoloured. 2n = 14.** Native to central and southern Europe, on sunny, dry, stony and grassy slopes of uplands. Hu, Pl, Ro, Sk.

**1756. *Dorycnium herbaceum* Vill., *D. pentaphyllum* subsp. *herbaceum* (Vill.) Rouy, *D. intermedium* Ledeb.** — Perennial, stems 20-65 cm, weakly woody at base, ramified above, patent-pubescent. **Seeds**

**spherical or ellipsoid, non-flattish or only slight hilum distinct, round, 2.1-2.5 x 1.7-2 mm. Surface smooth, lustrous, olive-green to brown, spotted or unicoloured. 2n = 14.** Native to central and southern Europe, Asia Minor, on clay and limestone soils, roadsides, banks, slopes, pastures, up to elevation 1600 m. Hu, Mo, Pl, Ro, Sk, Uk.

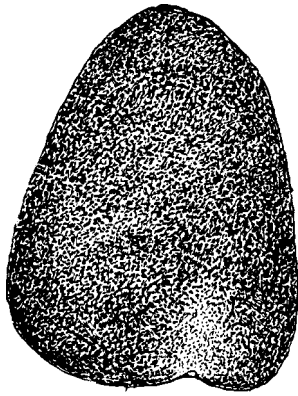
**1757. *Pisum arvense* L., *P. sativum* subsp. *arvense* (L.) Čelak.** — Annual, stems right-twining, 30-150 cm high. **Seeds globose to angular or ellipsoid, hilum ovoid or oval, 5-6 x 4.7-5.8 mm. Surface dull or slight lustrous, according to cvs light-brown to dark violet-brown. 2n = 14.** Commonly grown as component of fodder mixture (with rye or wheat); throughout the Carpathians.

**1758. *Pisum elatius* M. Bieb.** — Annual, stems up to 150 cm high. **Seeds globose, glandular, white, hilum elliptic, c. 1/8-1/6 of the circumference, 4-6 x 4-6 mm. Surface fine granular, cinnamon-brown, with little, darker spot and rare with one big black spot. 2n = 14.** Native to the Mediterranean region and southwestern Asia; probably the mother species of the cultivated cvs.

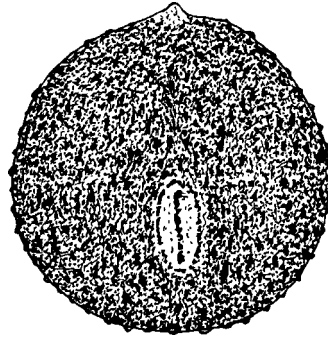
**1759. *Pisum sativum* L. subsp. *sativum*** — Annual, bare, stems 20-200 cm high, poorly branched, procumbent or twining. **Seeds broad ellipsoid to globose, sometimes slight flattish, hilum c. 1/14-1/10 of the circumference, 6-8 x 6-7.5 mm. Surface dull or lustrous, light-yellow to dark-brown, according to cultivars. 2n = 14.** Native to southern Europe, since prehistoric times cultivated for its edible seeds in many cvs; in all Carpathian regions.

**1760. *Lotus angustissimus* L., *L. gracilis* Waldst. et Kit.** — Annual to biennial, stems 5-35 cm high, slender, numerous, ascendent, rarely erect. **Seeds globose or ellipsoid, non-flattish or only very slight, 0.7-0.9 x 0.6-0.8 mm. Surface smooth, dull, yellow to violet-brown, seldom spotted. 2n = 24.** Native to the Mediterranean, in pine forests, dunes, marshy turfs, up to elevation of 1500 m. Hu, Ro, Uk.

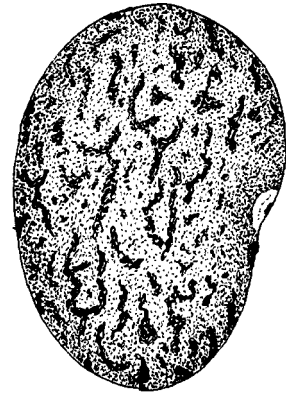
**1761. *Lotus corniculatus* L., *L. pentaphyllum* Gilib.** — Perennial, stems procumbent or ascendent, 5-40 cm long, poorly branched, glabrous or lashed on veins. **Seeds globose or ellipsoid, radicle thick, half of the cotyledonary lobe non- or very slight flattish, 1.3-1.6 x 1-1.3 mm. Surface smooth, lustrous, yellowish-brown to brown, unicoloured**



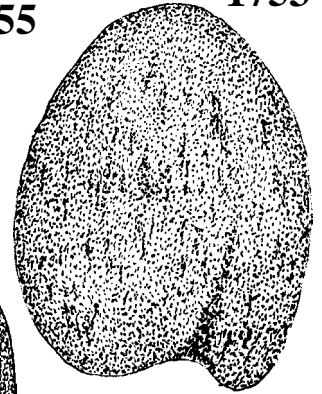
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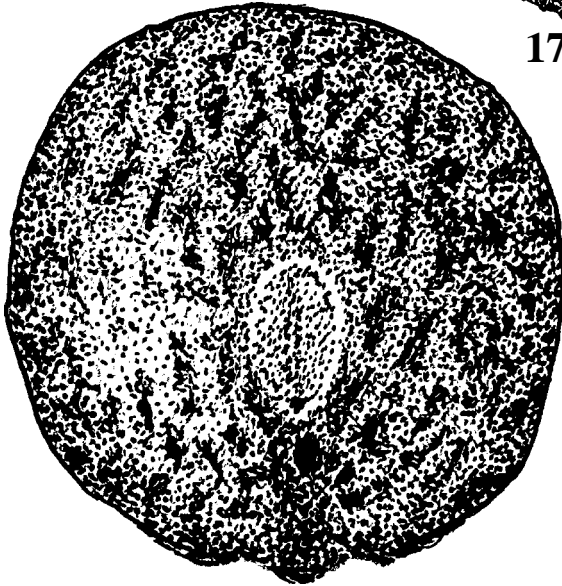
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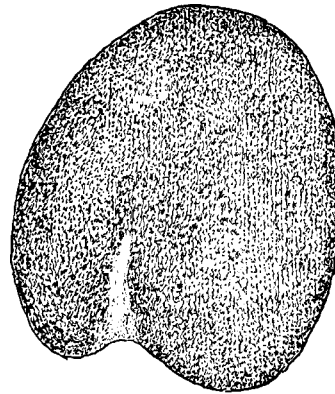
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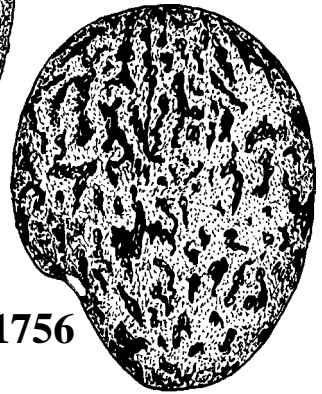
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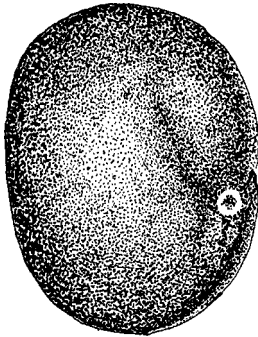
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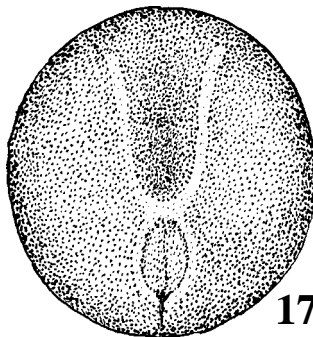
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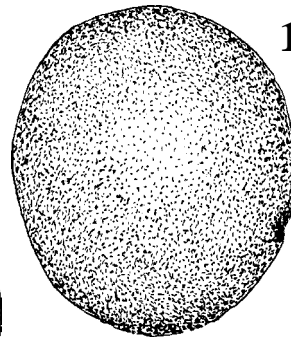
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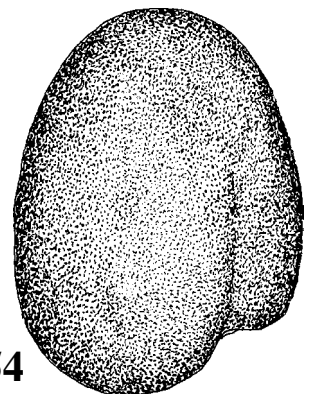
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or **black-spotted**. **2n = 24**. Native to whole Europe and Asia, on meadows and mountain grassy slopes; throughout the Carpathians.

**1762. *Lotus tenuis*** Waldst. et Kit. ex Willd., *L. campestris* Schur – Perennial, glabrous or with isolated hairs, stems erect, procumbent or ascendent, 10-90 cm long. **Seeds globose to reniform, non-flattish or only very slight, hilum rounded, 1.1-1.5 x 1-1.3 mm. Surface smooth, dull or slight lustrous, light- to dark-brown, mostly spotted. 2n = 12.** Native to central, southern Europe and Siberia, in damp soils, on riverbanks and swamps. Mo, Pl, Ro, Sk, Uk.

**1763. *Lotus uliginosus*** Schkuhr, *L. pedunculatus* auct. non Cav. – Perennial, stems erect or ascendent, 30-100 cm long, hollow, glabrous or lanate, abundantly ramified. **Seeds globose or broad reniform, non-flattish or only very slight, hilum round, 1.2-1.4 x 1-1.2 mm. Surface smooth, dull, yellowish, olive-green to brown, unicoloured. 2n = 12, 24.** Native to most of Europe, northern Africa, in damp grassy places, woodlands, can withstand summer droughts. Pl, Ro, Sk, Uk.

**1764. *Tetragonolobus maritimus*** (L.) Roth, *Lotus siliguosus* L., *L. maritimus* L. – Perennial, scattered hirsute, stems ramified, procumbent or ascendent, 10-40 cm high. **Seeds globose to broad ellipsoid, lateral flattish, radicular and the cotyledonary lobes not separated, hilum sunken, circular, 2-2.4 x 1.8-2.2 mm. Surface dull, smooth, yellowish-green to dark-brown, spotted. 2n = 14.** Native to southern Europe, on semi-dry turfs, wet meadows, pastures, moorlands. Hu, Mo, Ro, Sk, Uk.

**1765. *Tetragonolobus purpureus*** Moench, *Lotus tetragonolobus* L. – Annual, shortly hirsute, stems erect, 10-40 cm high. **Seeds elliptic or globose, hilum circular, chalaza with a dark spot, 4-4.7 x 3.3-3.7 mm. Surface smooth, dull, violet-brown. 2n = 14.** Native to southern Europe, on moist meadows, ravines, road margins. Sometimes cultivated as a vegetable. Mo, Uk.

**1766. *Anthyllis alpestris*** (Kit. ex Schult.) Hegetschw., *A. vulneraria* subsp. *alpestris* (Kit. ex Schult.) Asch. et Graebn. – Perennial, stems ascending or erect, 5-30 cm high, unbranched, in the lower part appressed hirsute. **Seeds ± ellipsoid, lateral flattish, 2.5-2.8 x 1.6-1.8 mm. Surface glabrous, faint lustrous, upper 1/3 green, lower 2/3**

**yellowish. 2n = 12.** Native to Europe, on mountain ridges, pastures, planes, rocks, screes, on calcite and dolomite grounds. Pl, Ro, Sk, Uk.

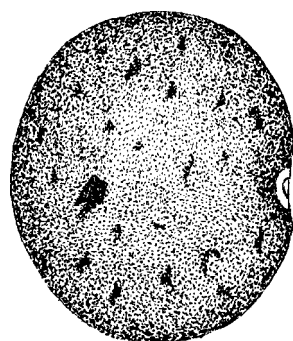
**1767. *Anthyllis montana*** L., *A. sericea* Lag. non Willd. – Perennial, with woody stems, often forming large clumps. **Seeds ellipsoid, lateral slight compressed, hilum roundish, 2.4-2.7 x 1.8-2 mm. Surface glabrous, slight lustrous, brown. 2n = 12.** Native to the Alps and mountains of southern Europe; in the Carpathians only in Romania (?).

**1768. *Anthyllis polyphylla*** (Ser.) Kit. ex A. Kern., *A. vulneraria* subsp. *polyphylla* (Ser.) Nyman, *A. macrocephala* Wender. – Perennial, stems coarse, 30-90 cm high, erect, branched, hirsute, dense patent below, appressed above. **Seeds ellipsoid, biconvex, lateral compressed, hilum in the middle of the ventral side, 2.3-2.5 x 1.6-1.8 mm. Surface glabrous, faint lustrous, upper 2/5 green, bottom 3/5 yellowish. 2n = 12.** Native to European sunny grassy pastures, meadows, shrubby slopes, in humous, sandy soils; in all Carpathian territories.

**1769. *Anthyllis vulneraria*** L. – Perennial, stems 5-40 cm high, unramified, procumbent or ascendent, hirsute. **Seeds ellipsoid to slight reniform, flattish, radicle half of the cotyledons, hilum sunken, circular, 2.2-2.8 x 1.7-2 mm. Surface smooth, lustrous, basal part yellowish, upper part green. 2n = 12.** Native to whole Europe and northern Africa, on dry or semi-dry turfs, roadside verges, in warm sites, rarely cultivated as a forage plant; throughout the Carpathians, in many subspecies.

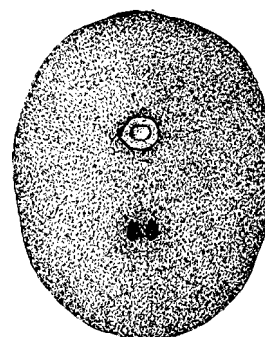
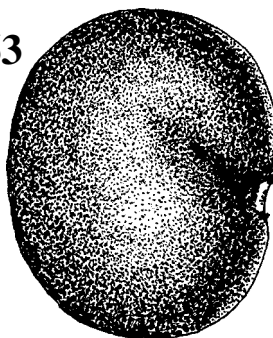
**1770. *Ornithopus compressus*** L. – Annual, downy, stems 10-50 cm high, numerous, unbranched, ascending. **Fruits legumes, crescent, curved especially in the upper part and tapered into a hooked beak, flattish, constricted, 20-50 mm long, pod (behind) 3.4-4.2 x 2.4-3 mm. Surface blackish when ripe, strongly reticulate with prominent veins. Seeds (in front) prism-shaped, lateral compressed, radicle not differentiated from the cotyledons, 2.8-3.2 x 2-2.2 mm. Surface glabrous, slight lustrous, pinkish-brown. 2n = 14.** Native to the Mediterranean; rarely hauling into the Carpathians.

**1771. *Ornithopus perpusillus*** L. – Annual (perennial), stems procumbent up to ascendent, 10-30 cm long, slender, pubescent, ramified at base. **Fruits legumes, oblong-cylindric, ± straight, flattish, constricted, 10-20 x 1.5-2 mm, pod (behind)**

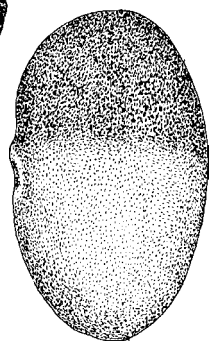


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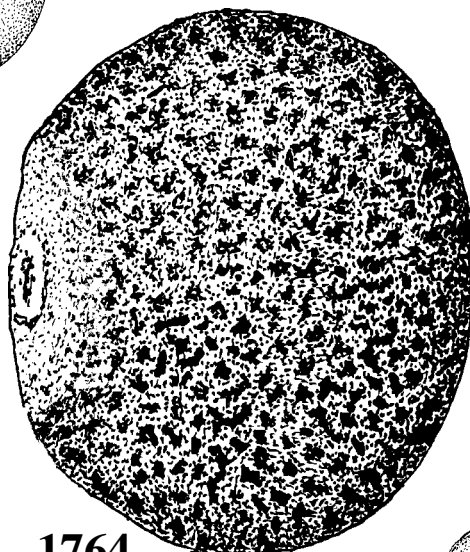
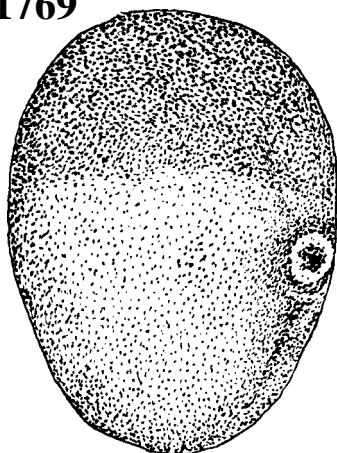


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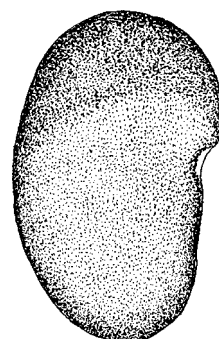


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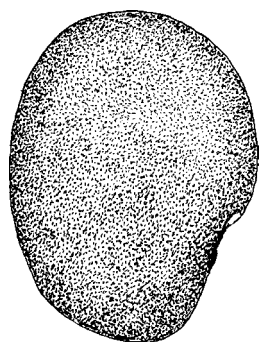
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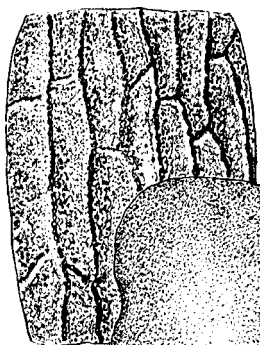
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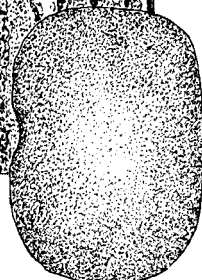
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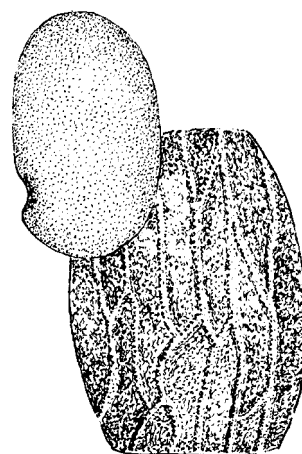
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1770



1771



**2.1-2.5 x 1.6-1.8 mm. Surface furry, strongly reticulate with prominent veins, brown. Seeds (in front) elliptic, flattish, radicle not separated from the cotyledons, 1.5-1.8 x 1-1.2 mm. Surface minute granulate, orange-brown to reddish-brown. 2n = 14.** Native to western Europe, in lowland sandy calcifugous soils, roadside verges, fields; hauling into the Carpathians on sandbanks and pastures.

**1772. *Ornithopus sativus* Brot.** — Annual, pubescent, stems ascendent or erect, 30-60 cm high, much ramified. **Seeds elliptic to broad elliptic or reniform, flattish, radicle c. half of the cotyledons, hilum sunken, circular, 2.1-2.5 x 1.5-1.7 mm. Surface smooth, orange- to reddish-brown. 2n = 14.** Native to southwestern Europe; in the Carpathians sometimes cultivated as a forage plant and for green manuring, grows on poor sandy soils.

**1773. *Coronilla coronata* L., *C. montana* Jacq.** — Perennial, stems erect, unbranched, bare, 30-70 cm high. **Seeds cylindric, slight flattish, hilum in the middle of the ventral side, round or obovate, 3.4-3.8 x 1.8-2 mm. Surface smooth, slight lustrous, rusty- to reddish-brown. 2n = 10, 12.** Native to southern and central Europe, Asia Minor, on dry, sunny, stony calcareous stands, light forests, stony and grassy slopes. Hu, Pl, Ro, Sk, Uk.

**1774. *Coronilla cretica* L.** — Annual, up to 10-60 cm high, leaflets 3-8 pairs, 5-20 mm, obovate-oblong. **Seeds strong oblong, lateral slight compressed, 4.5-5 x 0.9-1.1 mm. Surface on lateral sides with distinct or indistinct longitudinal ribs, glabrous, yellowish or pale-brown.** Native to southeastern Europe, in grassy places and as a ruderal. Ro, Uk.

**1775. *Coronilla elegans* Panč.** — Perennial, stems ramified, 30-70 cm high, bare or scattered hirsute, roundish. **Seeds elliptic, slight flattish, with indistinct keel, 4.2-4.6 x 1.4-1.6 mm. Surface humpy, dull or slight lustrous, olive-green to greenish-brown. 2n = 12.** Native to Europe (the Carpathians and the Balkan mountains), in light woods, shruberies, rarely cultivated as an ornamental plants. Hu, Mo, Ro, Sk, Uk.

**1776. *Coronilla emerus* L.** — Semishrub, up to 100 cm high, twigs hirsute, glabrous later on. **Seeds narrow ellipsoid, cylindric, without keels on sides, hilum in the middle of the long axis, circular,**

**sunken, 3.5-4.5 x 1.2-1.4 mm. Surface smooth, lustrous, olive- to reddish-brown. 2n = 14.** Native to southern Europe, amongst scrubs, especially in basic soils, up to elevation of 1300 m; often cultivated as an ornamental plant in gardens. Hu, Ro, Sk.

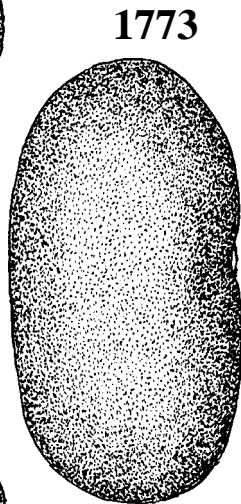
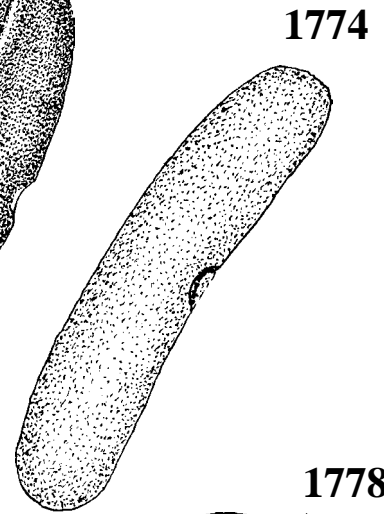
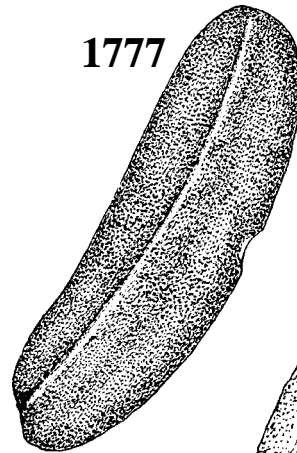
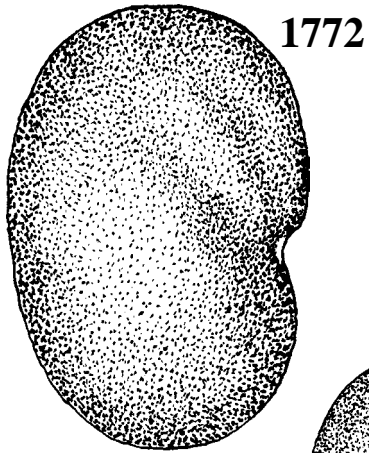
**1777. *Coronilla scorpioides* (L.) Koch** — Annual, glabrous, stems erect or ascendent, 10-40 cm high, often ramified at base. **Seeds oblong-cylindric, flattish, with distinct keel on both sides, 4-4.5 x 1.2-1.4 mm. Surface smooth, slight lustrous, dark-brown. 2n = 12.** Originally growing in southern Europe, southwestern Asia, on fields, dry, open habitats; often hauling as a weed or ruderal into the Carpathians.

**1778. *Coronilla vaginalis* Lam.** — Semishrub, minute, glabrous, stems ascendent, caespitose, 20-50 cm high. **Seeds oblong-cylindric, flattish, with indistinct keels on sides, 2.7-3.3 x 1.5-1.8 mm. Surface smooth or humpy, dark- to violet-brown. 2n = 12.** Native to the mountains of central and southern Europe, in dry grasslands, scrubs and open woods, calcicole. Hu, Pl, Ro, Sk.

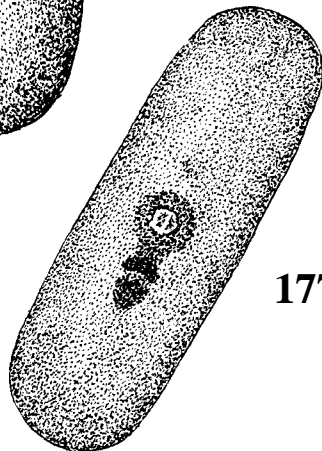
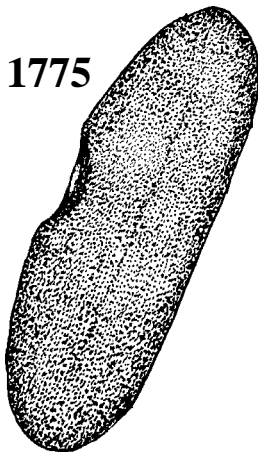
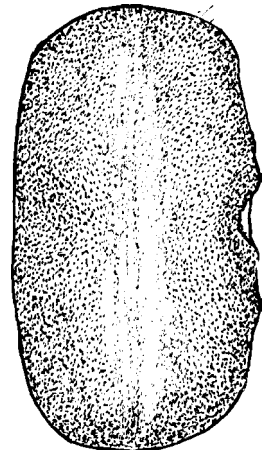
**1779. *Coronilla varia* L.** — Perennial, glabrous, stems numerous, ramified, procumbent, ascendent or twining, 20-100 cm high. **Seeds narrow elliptic to cylindric, slight flattish, with keels on sides, hilum rounded or obovate, 3.3-3.7 x 1.2-1.5 mm. Surface smooth, dull or slight lustrous, pale-brown to violet-brown. 2n = 24.** Native to Europe and western Asia, in meadows, light forests, boundaries, weed in cereals; throughout the Carpathians.

**1780. *Spartium junceum* L., *Cytisus junceus* (L.) Vuk.** — Shrub up to 2-3 m high, stems erect, cylindric, longitudinal furrowed, glabrous. **Seeds ellipsoid or oval, cordiform, compressed, radicle as long as cotyledons, 3.7-4.1 x 3.3-3.5 mm. Surface glabrous, lustrous, yellowish-brown to dark-violet. 2n = 48.** Native to the Mediterranean as far as Asia Minor, on dry slopes; in the Carpathians rarely cultivated in parks and gardens as an ornamental, rarely naturalized. Ro, Uk.

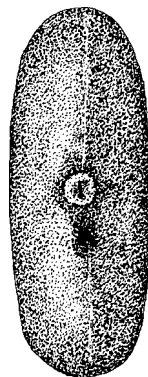
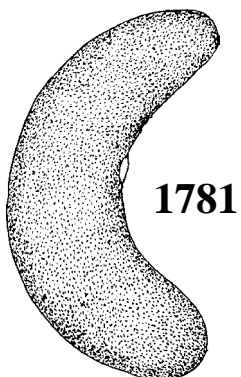
**1781. *Hippocrepis comosa* L., *Coronilla depressa* Kit, *H. perennis* Lam.** — Perennial, semishrub, stems numerous, branched, ascendent or erect, up to 40 cm high, woody at base. **Seeds sickle- or moon-shaped, apex and base rounded, 3.2-3.8 x 1.2-1.4 mm. Surface smooth, lustreless, unicoloured, seldom**



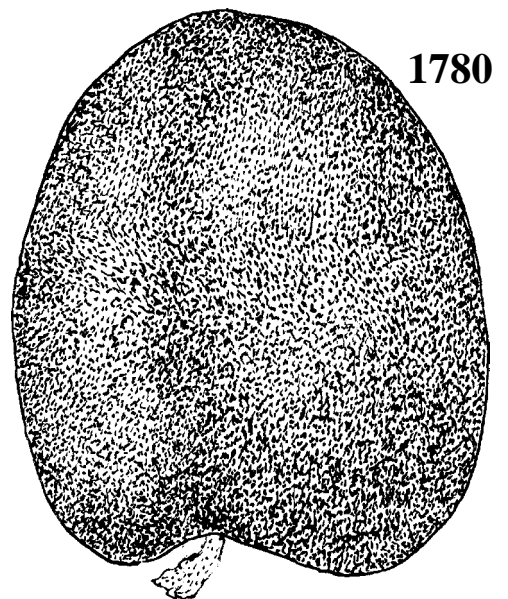
1778



1776



1779



**spotted, yellowish-green to brown.  $2n = 28$ .** Native to Eurasia, on sunny, grassy and stony slopes, semi-steppe meadows, vineyards, light forest steppes. Hu, Pl, Ro, Sk, Uk.

**1782. *Hippocrepis unisiliquosa* L.** — Annual, stems 7-20 cm high, bare, flowers situated in leaf-axils. **Seeds rainbow crooked in an quadrangular cover, 4.5-5 x 4.5-5 mm. Surface of the seeds glabrous, slight lustrous, yellowish-brown.** Native to the Crimea; in the Carpathians rarely cultivated in botanical gardens as an interesting plant.

**1783. *Scorpiurus muricatus* L.** — Annual, glabrous or downy, stems up to 80 cm high, ramified at base, leafy. **Seeds reniform to semilunate, hilum black, 3.7-4.2 x 1.8-2.2 mm. Surface smooth, yellowish to brown.  $2n = 28$ .** Native to the Mediterranean, mainly on rocky slopes, especially limestone and fallow fields, up to elevation 800 m; rarely hauling into the Carpathians.

**1784. *Hedysarum coronarium* L.** — Perennial, up to 30-100 cm high, sparsely appressed-pubescent, leaflets 3-5 pairs. Legume with 2-4 spinulose, but otherwise glabrous segments. **Seeds encased in a flattened seed pods or loments having three to eight ovoidal segments which split into unhulled seeds with a rough, thorny surface, 6-6.5 x 5-5.5 mm; hulled seeds (right down) ellipsoid, lateral strong compressed, radicle short, up to half of the seed, cotyledons mighty, 2.5-2.9 x 2.2-2.5 mm. Surface glabrous, glossy, orange-reddish.  $2n = 16$ .** Native to the central and western part of the Mediterranean region; in the Carpathians very rarely cultivated for fodder in the warmest areas and as an ornamental in gardens.

**1785. *Hedysarum grandiflorum* Pall.** — Perennial, stems ramified, rigid, with a rosette at base. **Seeds globose, elliptic to asymmetric-cordiform, flattish, 2.2-2.5 x 2-2.2 mm. Surface smooth, dull, dark-brown.** Native to southeastern Europe, in forest steppes, stony slopes on calcareous soils. Ro, Uk.

**1786. *Hedysarum hedysaroides* (L.) Schinz et Thell., *H. obscurum* L.** — Perennial, glabrous or scattered hirsute, stems  $\pm$  single, 10-40 cm high, erect or ascendent,  $\pm$  ramified. **Seeds ellipsoid, asymmetric-reniform, flattish, radicle slight differentiated, 2.8-3.6 x 2.2-2.8 mm. Surface smooth, lustrous, yellowish- to dark-brown, unicoloured or spotted.**

**$2n = 14$ .** Native to the mountains of Europe, on wet rocky and grassy meadows with calcareous soils. Pl, Ro, Sk, Uk.

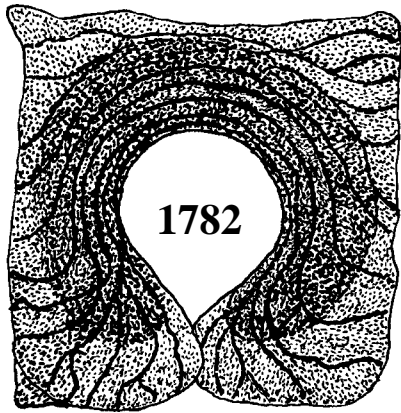
**1787. *Onobrychis alba* (Waldst. et Kit.) Desv., *Hedysarum album* Waldst. et Kit.** — Perennial, stems ascendent or erect, 30-50 cm high, woody, pubescent at base. **Seeds encased in a flattened indehiscent 1-seeded seed pods (left), margin with 4-6 bradawl dents, 1-2 mm long, 5.7-6.3 x 4.4-4.8 mm; seeds (right down) elliptic to reniform, flattish, radicular lobe 1/3-1/2 of the cotyledonary one, 2.8-3.2 x 2.1-2.4 mm. Surface smooth, slight lustrous, olive-brown, brown or black.** Native to the Balkan Peninsula. Ro.

**1788. *Onobrychis arenaria* (Kit.) DC., *O. reticulata* Opiz, *Hedysarum arenarium* Kit. ex Schult.** — Perennial, pubescent or subglabrous, stems numerous, ascendent, 10-80 cm high. **Seeds encased in a flattened indehiscent 1-seeded pods (left), margin dentate; seeds (behind) reniform to elliptic, flattish, 3-3.6 x 2.1-2.5 mm. Surface smooth, dull or slight lustrous, olive-green to brown, hilum rounded or oval.  $2n = 14$  (28).** Native to southern Europe and western Asia, on dry sunny slopes, embankments, at vineyard and orchard edges, sandbanks; throughout the Carpathians.

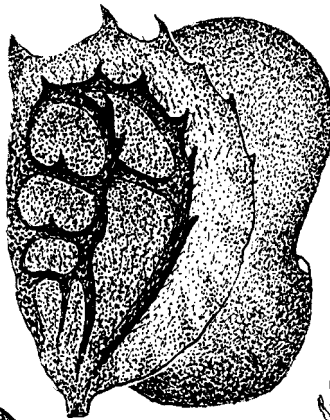
**1789. *Onobrychis montana* (Kit.) DC., *O. viciifolia* subsp. *montana* (DC.) Thell.** — Perennial, stems sparsely pubescent, numerous, procumbent up to ascendent, 10-50 cm high, leafy. **Seeds encased in a flattened indehiscent 1-seeded seed pods (left), margin with 4-8 dents, 0.5-2 mm long; seeds reniform, slight flattish, hilum indistinct, slight prolonged, 4-4.6 x 2.8-3.2 mm. Surface smooth, slight lustrous to dull, pale-brown to brown.  $2n = 28$ .** Native to central Europe and the Balkan region, on stony and grassy slopes of subalpine and alpine zones. Pl, Ro, Sk.

**1790. *Onobrychis viciifolia* Scop., *O. sativa* Lam.** — Perennial, shortly scattered hirsute, stems few, erect, 10-80 cm high, densely leafed above, sparsely below. **Seeds encased in a flattened indehiscent 1-seeded seed pods (left), margin dentate, 6-8 dents till 1 mm long, 6.5-7.5 x 5-5.6 mm; seeds reniform, lateral flattish, radicle 1/3-half of the cotyledons, hilum sunken, circular, 3.8-4.2 x 2.8-3.2 mm. Surface smooth, lustrous, brown.  $2n = 28$ .** Native to southeastern Europe, at boundaries, in dry meadows of

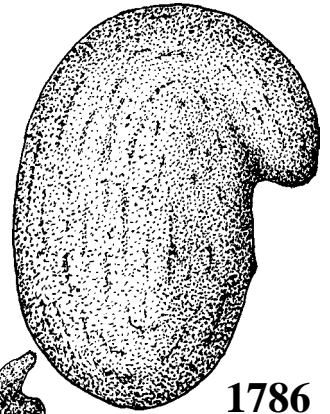




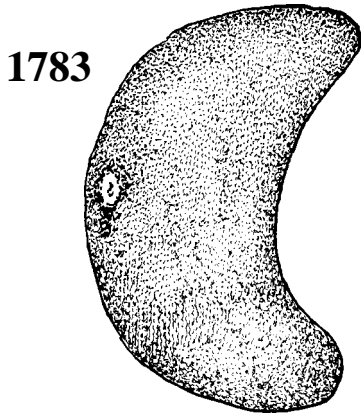
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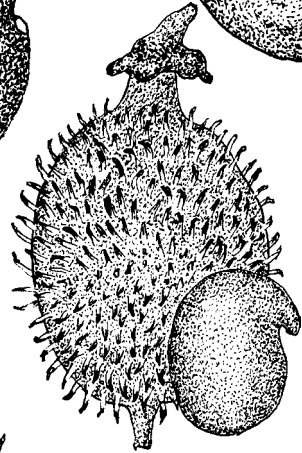
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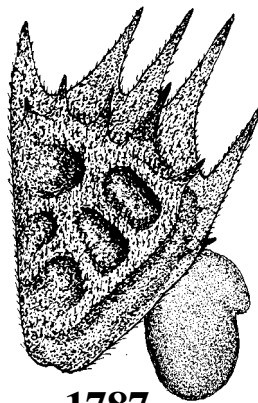
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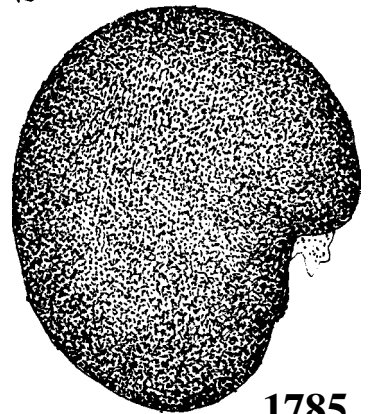
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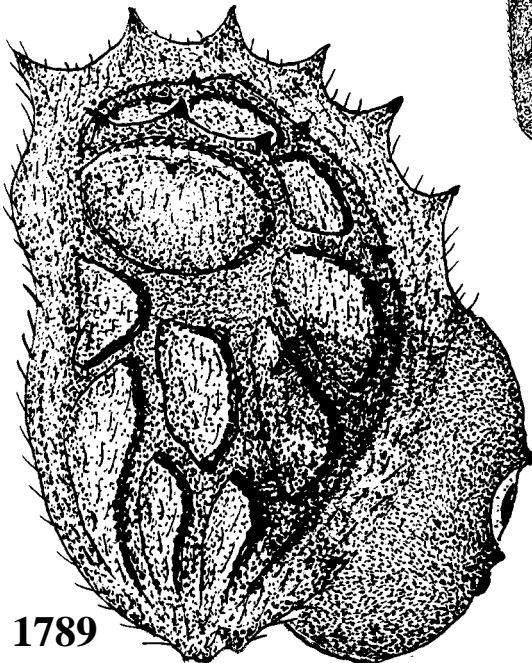
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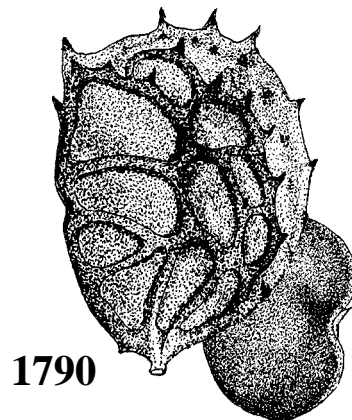
1787



1785



1789



1790

warmer areas; widely cultivated as a fodder plant rich in proteins, often naturalized.

**1791. *Arachis hypogaea* L.** – Annual, stems much ramified, up to 50 cm high, pubescent. **Seeds cylindric-ellipsoid, apex rounded, acuminate below, hilum indistinct, 16-20 x 9-11 mm. Surface wrinkly, dull, reddish-brown.  $2n = 40$ .** Originally spread from tropical South America; in southern Europe cultivated for the edible seeds (ground-nut), containing 40-55 % of oil. Hu, Mo, Ro, Uk.

**1792. *Psoralea bituminosa* L., *Aspalathium bituminosum* (L.) Kuntze, *Bituminaria bituminosa* (L.) Stirton** – Perennial or subshrub, stems ramified 20-100 cm high, sparsely to dense pubescent, smelling of bitumen, flowers in heads. **Unhulled seeds obovoid or reniform, flattish, lanceolate beak on the apex, base rounded, 10-12 x 2.8-3.6 mm. Surface rough, dense hirsute with black spines, pubescent, lustreless, greyish to greyish-brown, beak yellowish.** Native to southern Europe, western Asia and northern Africa, in dry grassy places, open grounds and woodlands, up to 900 m. Mo, Ro, Uk.

## 60. HAMAMELIDACEAE

**1793. *Hamamelis japonica* Siebold et Zucc.** – Shrub or a small tree, up to 10 m high with lay-out twigs. **Seeds cylindric, apex tapered, rounded, base rounded, hilum depressed, 7.3-7.8 x 3.3-3.7 mm. Surface smooth, strong lustrous, blackish-brown.** Originally growing in Japan and China; rarely cultivated in parks as an ornamental shrub, in warmer areas. Uk.

**1794. *Hamamelis virginiana* L.** – Shrub up to tree, 2-5 m high, leaves obovoid, 8-15 cm long. **Seeds oblong-ovoid or pyriform, bottom rounded, hilum deep depressed into the bottom, ellipsoid, 7.3-7.7 x 3.2-3.4 mm. Surface smooth, glossy, blackish-brown.** Native to North America; in the Carpathians rarely planted in parks and gardens as a decorative species. Uk.

**1795. *Parrotia persica* C. A. Meyer** – Small tree, up to 5 m high, with smooth, layered bark. **Seeds narrow cylindric, apex tapered, pointed, base rounded with two whitish areas, 7.4-8 x 3.1-3.5 mm. Surface smooth, strong lustrous, cinnamon-brown.** Originally growing in Persia; rarely cultivated in parks in warmer areas of the Carpathians.

**1796. *Liquidambar styraciflua* L.** – Robust tree up to 45 m high with deeply crackled bark. **Seeds prolonged ellipsoid, apex more or less truncate or rounded, wider than the base, 8-9 x 2.7-3.2 mm. Surface smooth, lustreless, light-brown spotted, spots dark-brown.** Native to North America; rarely cultivated in parks of warmer areas in the Carpathians. Uk.

## 61. HYPERICACEAE

**1797. *Hypericum androsaemum* L.** – Shrub up to 80 cm high, spreading, 2-lined. **Seeds prolonged ellipsoid, keeled on ventral side, 1-1.3 x 0.4-0.6 mm. Surface fine furrowed and verrucose, dark-brown.** Native to the western and southern Mediterranean up to western Asia, in shady, moist places, woodland margins, stream banks, in mountains up to 1300 m; in the whole Carpathians.

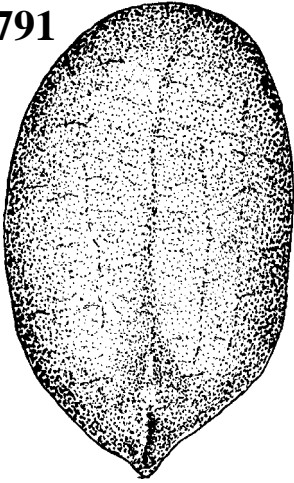
**1798. *Hypericum barbatum* Jacq.** – Perennial, stems 10-45 cm high, erect or decumbent, leaves 6-40 mm, lanceolate to linear-lanceolate or elliptic-oblong. **Seeds oblong-ellipsoid, slight crooked, 1-1.2 x 0.5-0.6 mm. Surface longitudinal ribbed, slight lustrous, pale-brown.** Native to the Balkan Peninsula, in meadows and stony places. Hu.

**1799. *Hypericum calycinum* L.** – Perennial or semishrub, stems 4-angular, 20-60 cm high, erect, usually unbranched. **Seeds prolonged cylindric, mostly more or less curved, winged, 1.6-1.9 x 0.3-0.5 mm. Surface with prolonged pits foveolate, high lustrous, dark-brown, wing pale-brown.** Native to Asia Minor and the eastern Mediterranean region, in shady woodlands and banks of warmer areas; cultivated as an ornamental in gardens and parks. Mo, Ro, Sk, Uk.

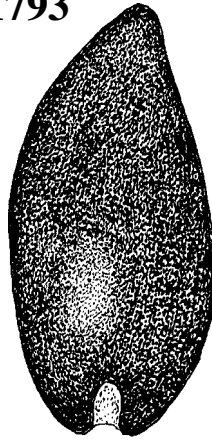
**1800. *Hypericum elegans* Stephan ex Willd., *H. kohlianum* Spreng., *H. pulchrum* Pall.** – Perennial, stems erect, 20-50 cm high, simple or shortly ramified, glabrous, roundish below, with two narrow rails above. **Seeds prolonged cylindric, more or less curved, keeled on ventral side, 1-1.2 x 0.4-0.5 mm. Surface tuberculate with cellulose structure, cinnamon-brown.  $2n = 32$ .** An Eurasian element, somewhat calcicole, on sunny dry strands, shrubberies, at forest margins. Hu, Mo, Pl, Ro, Sk, Uk.

**1801. *Hypericum hirsutum* L., *H. villosum* Crantz** L. – Perennial, stems 40-100 cm high, erect, tufted, dense shortly pubescent, unramified. **Seeds**

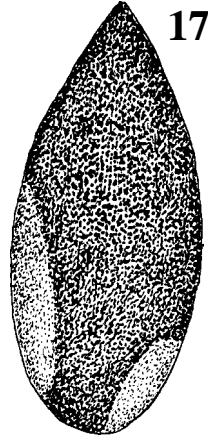
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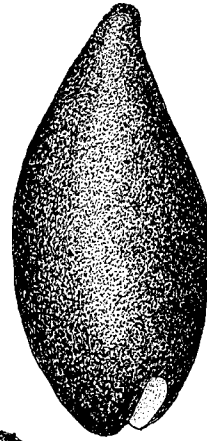
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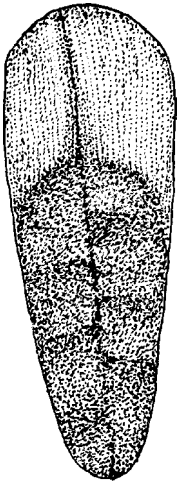
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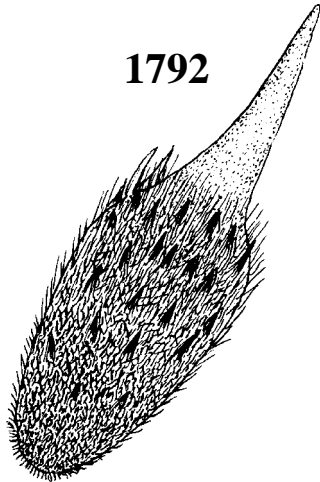
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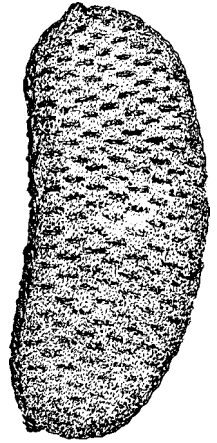
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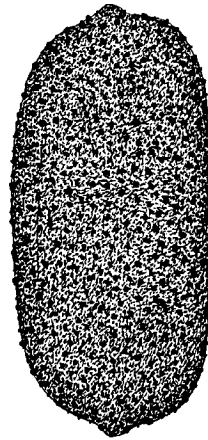
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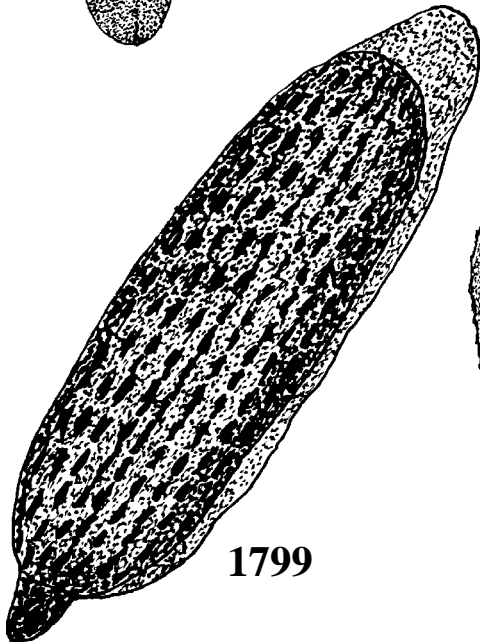
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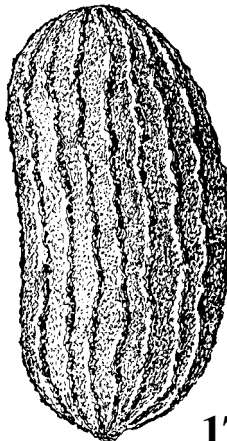
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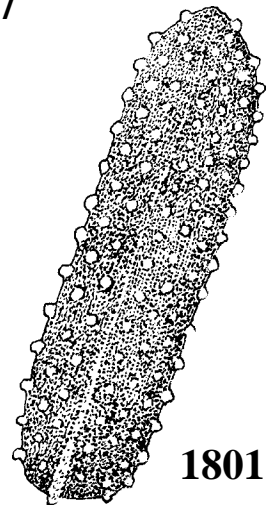
1799



1798



1801



prolonged cylindric, keeled on ventral side, rounded on both ends, 0.9-1.1 x 0.35-0.45 mm. Surface papillary, dull, pale- or reddish-brown. **2n = 18.** An Euro-Siberian element, in woods, at riverbanks, roadsides, shrubberies, felled areas. Hu, Mo, Pl, Ro, Sk, Uk.

**1802. *Hypericum humifusum* L., *H. exiguum* Bubani** – Annual, mostly perennial, stems decumbent or procumbent, 10-40 cm high, slender, weakly ramified, with 2 rails above. **Seeds elliptical to cylindric straight, suture indistinct, 0.5-0.7 x 0.35-0.45 mm. Surface strong glittery, coarse reticulate, nut- to dark-brown. 2n = 16.** Native to western, central and southern Europe, on wet pastures, forest roads and edges, usually a calcifuge. Br, Hu, Pl, Ro, Sk, Uk.

**1803. *Hypericum maculatum* Crantz, *H. fallax* Grimm, *H. tetragonum* Fr.** – Perennial, stems erect, up to 100 cm high, simple or poorly branched. **Seeds cylindric, rounded at both ends, straight, apex often narrower, 0.9-1.1 x 0.4-0.5 mm. Surface fine reticulate, lustrous, light- or dark-brown. 2n = 16.** Native to whole Europe and western Siberia, common in damp places, mountain meadows, pastures, shrubberies, forests. Hu, Pl, Ro, Sk, Uk.

**1804. *Hypericum montanum* L., *H. elegantissimum* Crantz** – Perennial, stems 30-80 cm, erect,  $\pm$  unramified, glabrous, roundish. **Seeds narrow cylindric, straight, sometimes slight curved, raphe visible as suture, 0.8-1 x 0.3-0.4 mm. Surface strong lustrous, fine reticulate, nut to dark-brown. 2n = 16.** Native to western and central Europe, in dry thickets and woodlands at high attitudes, up to 2000 m, somewhat calcicole. Hu, Mo, Pl, Ro, Sk, Uk.

**1805. *Hypericum mutilum* L.** – Annual or perennial, stems 10-40 cm high, usually branched above the middle. **Seeds oblong-cylindric, apex with beak, 0.5-0.6 x c. 0.2 mm. Surface longitudinal furrowed and transversal ribbed, faint lustrous or lustreless, pale-brown.** Native to Europe, on marshes; in the Carpathians very rare. Pl.

**1806. *Hypericum perforatum* L., *H. officinarum* Crantz, *H. veronense* Schrank** – Perennial,  $\pm$  glabrous, stems erect, sometimes ascendent and rooting down at base, ramified above, up to 100 cm high. **Seeds narrow cylindric or elliptic, sometimes slight curved, 1-1.2 x 0.5-0.6 mm. Surface high lustrous, coarse reticulate, red- to dark-brown. 2n = 32.** Native all areas of Europe,

Asia and north Africa, on overgrown damp slopes, boundaries, meadows, pastures, rocks; throughout the Carpathians.

**1807. *Hypericum polyphyllum* Boiss. et Bal.** – Perennial, stems 15-20 cm high, procumbent, with thin twigs, dense covered with minute leaves, flowers yellow. **Seeds oblong oval, on both ends with small beaks, 1.4-1.6 x 0.6-0.7 mm. Surface longitudinal granulate, lustrous, pale to dark-brown.** Native to the Balkan Peninsula and Asia Minor, in montane zones; in the Carpathians cultivated in flowerpots as an ornamental.

**1808. *Hypericum pulchrum* L.** – Perennial, stems ascendent or erect, 20-60 cm high, rounded, glabrous, sometimes ramified. **Seeds narrow cylindric, sometimes slight curved, 1-1.2 x 0.4-0.5 mm. Surface lustrous, indistinct reticulate and with indistinct and small bladders, nut- to dark-brown. 2n = 18.** Native to northwestern Europe, in coniferous woodlands, heaths and shrubberies with acid soils. Pl.

**1809. *Hypericum richeri* Vill., *H. alpinum* Kit.** – Perennial, stems 10-50 cm, erect, from a creeping and rooting base. **Seeds slight curved or straight cylinder, with a small membranous winglet at apex, 1.5-1.7 x 0.5-0.6 mm. Surface slight lustrous with longitudinal furrows, pinkish-brown.** Native to the mountains of southern and southcentral Europe, in meadows and woods. Ro.

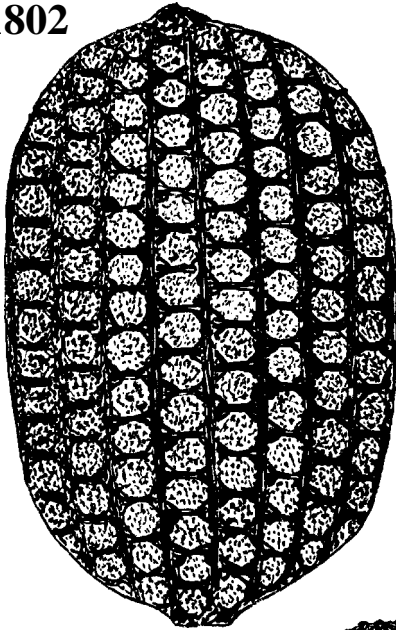
**1810. *Hypericum rumeliacum* Boiss.** – Perennial, stems sterile or fertile, 25-35 cm high, erect or decumbent, branching, rooting at the base. **Seeds narrow cylindric, straight, 1.2-1.3 x 0.5-0.6 mm. Surface high lustrous, fine reticulate, grey or pale-brown.** Epidemic to the Balkan Peninsula, in calcareous, stony places. Ro.

**1811. *Hypericum tetrapterum* Fries, *H. acutum* Moench** – Perennial, stems erect, 10-100 cm high, procumbent, rooting-down at base, narrowly 4-winged. **Seeds narrow cylindric, straight, 1-1.1 x 0.45-0.55 mm. Surface fine reticulate, lustrous, dark-brown. 2n = 16.** Native to Europe, Siberia and western Asia, in damp places, marshes, stream sides, wet shrubberies, up to altitude of 900m; throughout the Carpathians.

## 62. CISTACEAE

**1812. *Helianthemum alpestre* (Jacq.) DC., *H. oelandicum* (Jacq.) DC.** – Dwarf shrubs, stems dense

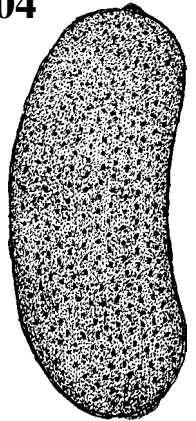
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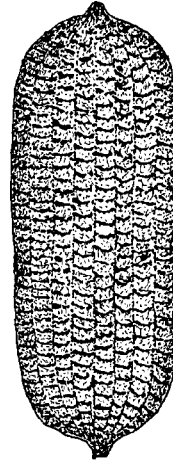
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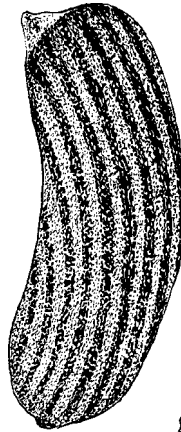
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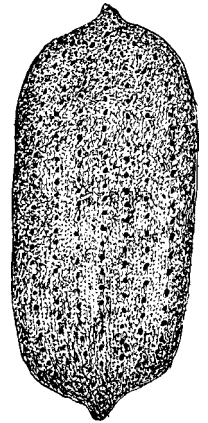
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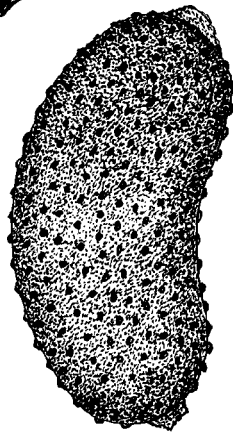
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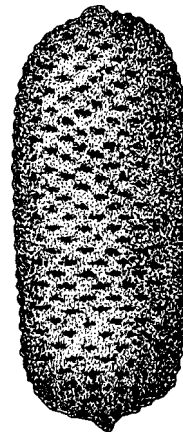
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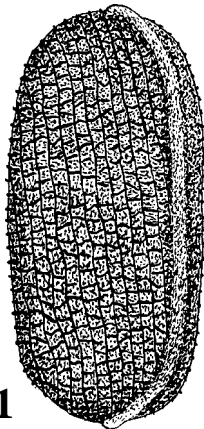
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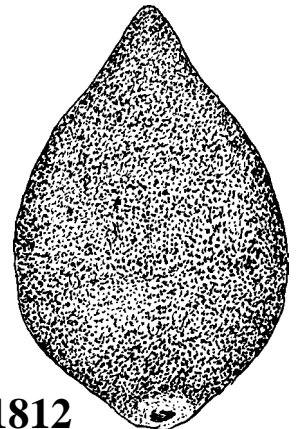
1810



1811



1812



tufted, procumbent, ascendent, 3-17 cm high. **Seeds ovoid with narrowed apex, base rounded, 1.4-1.8 x 0.9-1.1 mm. Surface smooth, lustrous, minute tuberculate, dark-brown.  $2n = 22$ .** Native to the mountains of central and southern Europe, on screes, sunny calcareous rocks. Pl, Ro, Sk.

**1813. *Helianthemum apenninum* (L.) Mill., *H. polifolium* Mill.** — Perennial, lax, slight spreading, up to 40 cm, much branched from the base, leaves hoary, flowers white. **Seeds ovoid, mostly angular, compressed at 3-6 sides, rare rounded, slight clavate at the apex, hilum conical at the base, 1.8-2 x 1.2-1.3 mm. Surface whitish downy, dull, violetish, edges pale.  $2n = 20$ .** Native to southern and western Europe; in the Carpathians rarely cultivated in gardens, mostly in var. *roseum* Gross.

**1814. *Helianthemum canum* (L.) Baumg., *H. vineala* Spreng, *Rhodax canus* (L.) Fuss.** — Perennial, richly ramified, 10-20 cm, stems ascendent, felty. **Seeds ovoid with tapered apex and base, hilum rounded with whitish border, 1.3-1.5 x 1.1-1.3 mm. Surface smooth, dull, brown.  $2n = 22$ .** Native to the Mediterranean and central Europe, to the open slopes, steppes, screes, 800-2500 m. Au, Hu, Mo, Pl, Ro, Uk.

**1815. *Helianthemum grandiflorum* (Scop.) DC., *Cistus grandiflorus* Scop., *H. vulgare* Gaertn.** — Perennial, stems woody at base, 10-30 cm high. **Seeds ovoid, sometimes flattish, apex narrowed, base truncate, hilum rounded with white border, 1.7-1.9 x 1.4-1.6 mm. Surface dense verrucose, often farinose, lustreless, brown to dark-brown.  $2n = 20$ .** Native to the mountains of Europe, on meadows, screes and stony slopes in alpine and subalpine zones; in the whole Carpathian territories.

**1816. *Helianthemum ledifolium* (L.) Mill., *H. niloticum* (L.) Pers.** — Perennial, villous-tomentose, 10-60 cm high, variable in habit and size of parts. **Seeds subrhomboidal to pyramidal, slight compressed, 1.1-1.3 x 0.7-0.9 mm. Surface foveolate, smooth or papillose, wrinkly, purple.  $2n = 20$ .** Native to southern Europe, in dry places. Ro.

**1817. *Helianthemum nummularium* (L.) Mill., *H. vulgare* Garsault, *Cistus nummularius* L.** — Shrub, stems ascendent or procumbent, 10-50 cm high. **Seeds ovoid with tape, sometimes flattish, red apex and rounded base, hilum round, slight convex, 1.5-1.7 x 1.1-1.3 mm. Surface dense tuberculate, sometimes**

**farinose, brown to violet-brown.  $2n = 20$ .** Native to southern and central Europe, on sands, dry rocky slopes, shrubberies on basic soils; throughout the Carpathians.

**1818. *Helianthemum ovatum* (Thuill.) Mérat, *H. hirsutum* (Thuill.) Mérat** — Shrub, stems procumbent or ascendent, tufted, 10-40 cm high. **Seeds irregular-ovoid, apex dull acuminate, hilum rounded with border, 1.4-1.6 x 1.1-1.3 mm. Surface smooth, lustreless, brown.  $2n = 20$ .** Native to central Europe, on sunny stony and shrubby slopes, in light deciduous forests and dry pastures. Hu, Pl, Sk, Uk.

**1819. *Helianthemum rupifragum* A. Kern., *H. cretaceum* (Rupr.) Juz.** — Semishrub up to 20 cm high, stems dense tufted, procumbent or ascending, ramified, with numerous sterile stems. **Seeds ovoid or pyramidal, dorsal side convex, ventral rooflike, apex narrowed, acuminate, base broad, rounded, 1.5-1.8 x 0.9-1.1 mm. Surface faint lustrous, brown.  $2n = 22$ .** Native to the Carpathians and the Balkan Peninsula, on sunny stony slopes with calcareous grounds. Pl, Ro, Sk, Uk.

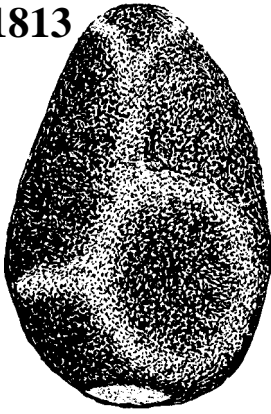
**1820. *Helianthemum salicifolium* (L.) Mill., *H. intermedium* (Pers.) Thib. ex Dunal** — Annual up to 30 cm high, variable in habit, usually much branched. **Seeds rhomboidal, compressed, bottom part pale with hilum, 0.9-1 x 0.7-0.8 mm. Surface whitish papillose, faint lustrous, pinkish-red.  $2n = 20$ .** Native to southern Europe, in dry calcareous places, shrubberies and steppes, altitude up to 1100 m. Ro, Uk.

**1821. *Fumana procumbens* (Dunal) Green. et Godr., *Cistus fumana* L., *Helianthemum procumbens* Dunal** — Perennial, twigs procumbent, ascendent, 10-40 cm high. **Seeds obovoid, sometimes flattish, often obtusely 3-angled in the transverse section, suture running from chalaza towards the apex and finish with small beak, 2-2.6 x 1.4-1.8 mm. Surface smooth, fine reticulate, olive- to dark-brown.  $2n = 32$ .** Native to southern Europe, on sunny, dry, rocky, stony or sandy, shrubby and grassy slopes. Hu, Mo, Ro, Sk, Uk.

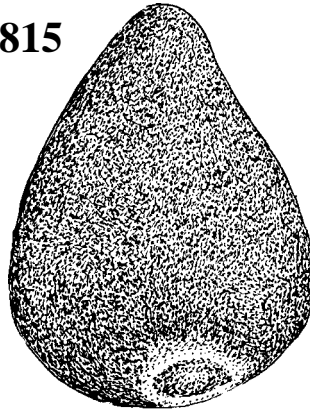
### 63. TAMARICACEAE

**1822. *Myricaria germanica* (L.) Desv., *Tamarix germanica* L.** — Shrub, bare, 50-250 cm, twigs erect, switched. **Seeds irregular-cylindric, twisted, apex rounded, base narrowed, with a wreathlet of hairs at the apex, feathery appendage, 1-1.2 x 0.2-0.3 mm. Surface fine reticulate, lustreless,**

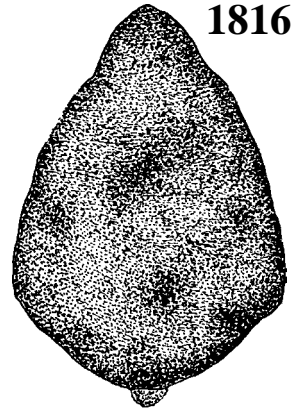
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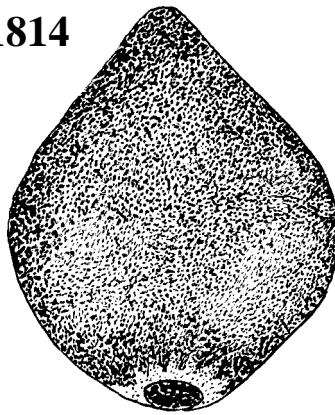
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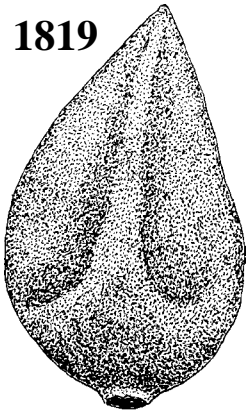
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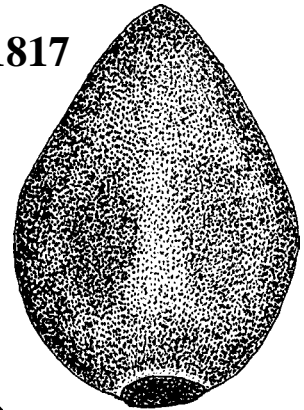
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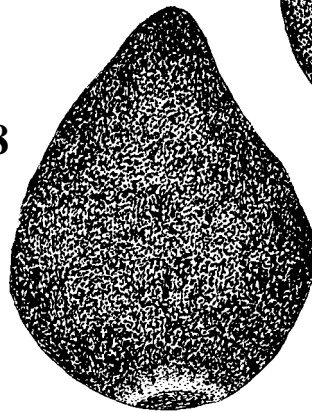
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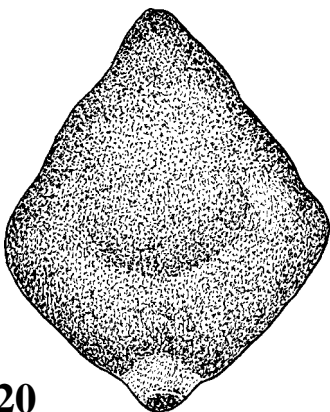
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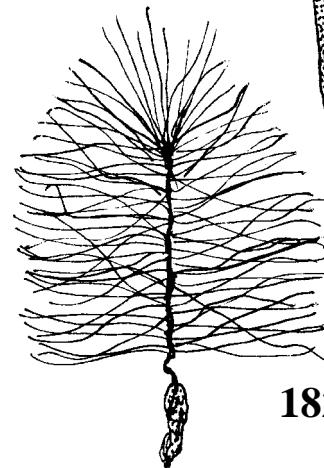
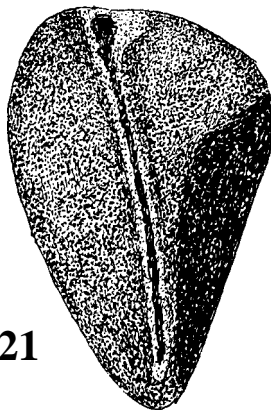
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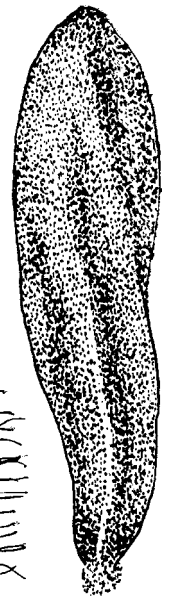
1820



1821



1822





**brown. 2n = 24.** Native to Eurasia, on sandy and stony river and brook silts of montane and subalpine zones, in cultivated saline soils. Hu, Pl, Ro, Sk, Uk.

**1823. *Tamarix gallica* L., *T. anglica* Webb** — Shrub or small tree, up to 10 m high, twigs entirely glabrous, switched. **Seeds obovoid, prolonged oval, with wreathlet of hairs at the apex, feathery appendage, 1-1.2 x 0.5-0.6 mm. Surface smooth, hairy, whitish. 2n = 24.** Native to the western Mediterranean; in the Carpathian areas cultivated as an ornamental and for shelter in parks and gardens, naturalized on coastal thickets.

**1824. *Tamarix ramosissima* Ledeb., *T. pentadra* Pall.** — Shrub, or small tree, glabrous, up to 3-4 m high, with reddish-brown bark. **Seeds cylindric, with a rosette of hairlets at the apex, feathery appendage, c. 0.3-0.5 x 0.2-0.3 mm. Surface wrinkly, greyish-brown. 2n = 24.** Native to river deposits like *Salix* species in southeastern Europe and southwestern Asia. Hu, Mo, Ro, Uk.

**1825. *Tamarix tetrandra* Pall. ex M. Bieb., *T. parviflora* DC.** — Shrub, up to 5 m high, strong ramified, twig bark pink-, dark- to black-brown. **Seeds cylindric with rosette of hairlets at the apex, c. 0.5 x 0.1 mm. Surface yellowish-white. 2n = 24.** Native to southeastern Europe and western Asia, damp places, mainly in the mountains; rarely cultivated in parks and along road networks in warmer and dryer areas. Hu, Mo, Uk.

#### 64. PYROLACEAE

**1826. *Pyrola chlorantha* Sw., *P. virens* Körte** — Perennial, glabrous, stems sharply up to wingly angular, 10-30 cm high, with some lanceolate scales. **Seeds spherical, enclosed in semitransparent pouches, with the distinct cellular structure, 0.5-0.7 x 0.2-0.3 mm. Surface lustrous, yellowish-brown. 2n = 46.** Native to the circumpolar territories, mostly in light pine woods, rarely in mixed woods and light oak woods; throughout the Carpathians.

**1827. *Pyrola media* Sw., *P. intermedia* Schleich p. —** Perennial, glabrous, stem erect with numerous green scales, 15-30 cm high. **Seeds globose, scarce visible in semitransparent prolonged pouches with slight distinct cellular structure, 0.3-0.5 x 0.1-0.2 mm. Surface lustrous, yellowish-brown. 2n = 92.** Native to northern Europe and North America, in coniferous and dwarf pine zones, on acid peaty and wet grounds. Hu, Pl, Ro, Sk, Uk.

**1828. *Pyrola minor* L.** — Perennial, stems shortly ascending, angular, 5-20 cm high, with 2 (-4) scales. **Seeds spherical enclosed in semitransparent, prolonged pouches with distinct cellular structure, 0.4-0.6 x 0.15-0.2 mm. Surface short lustrous, yellowish-brown. 2n = 46.** Native to the circumpolar territories of Europe and North America, in dry shady leafy and coniferous woods and meadows, on humous and stony grounds; in the whole Carpathians.

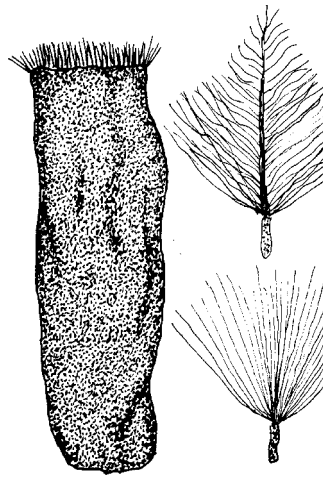
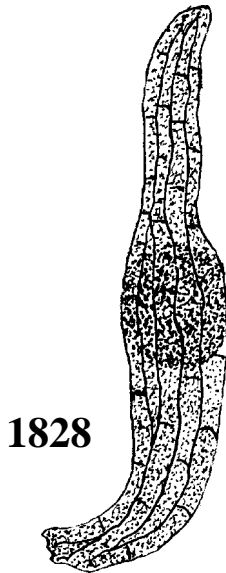
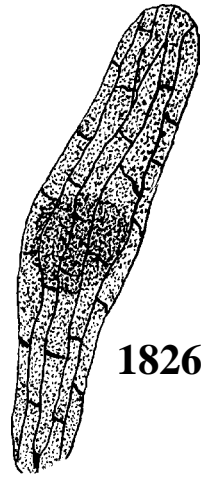
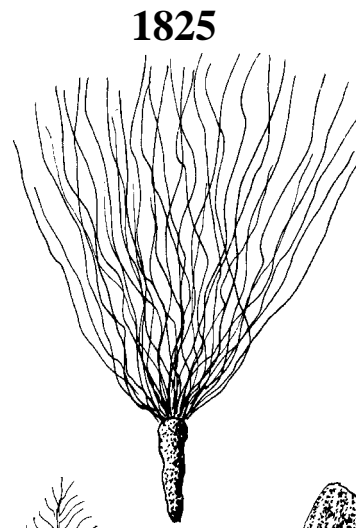
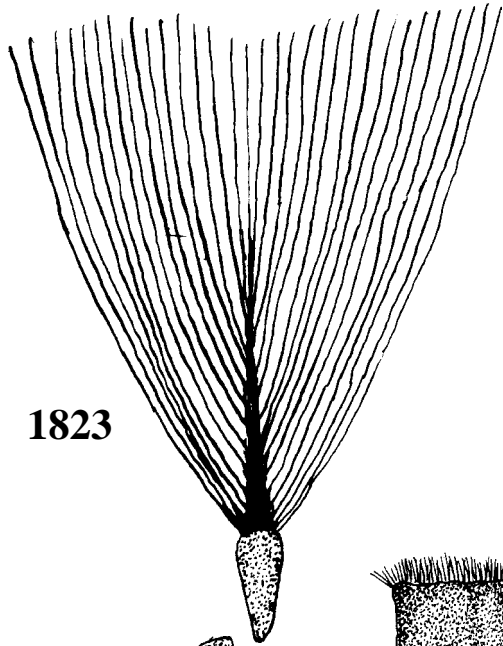
**1829. *Pyrola rotundifolia* L.** — Perennial, stems ascending, 20-30 cm high, 3-angular, with embraced, prolonged lanceolate scales above. **Seeds ± spherical in semitransparent pouches, consisting of prolonged cells, 0.5-0.6 x 0.1-0.2 mm. Surface lustrous, yellowish-brown. 2n = 46.** Native to circumpolar Europe and the northern part of North America, in shady coniferous and deciduous woods, on moist acid and basic peaty grounds. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**1830. *Orthilia secunda* (L.) House, *Ramischia secunda* (L.) Garcke, *Pyrola secunda* L.** — Perennial, glabrous, stems 5-25 cm high, ascending, much branched, scarcely scaled. **Seeds ± spherical in slight semitransparent prolonged pouches with indistinct cellular structure, 1.1-1.3 x c. 0.2 mm. Surface of the pouches longitudinal furrowed, high lustrous, yellowish-brown. 2n = 38.** Native to the circumpolar territories, in coniferous and leafy woods and shrubberies on moist, poor, sand-loamy soils; in all Carpathian territories.

**1831. *Moneses uniflora* (L.) A. Gray, *M. grandiflora* Salisb., *Pyrola uniflora* L.** — Perennial, stems 5-15 cm, erect, angular, with 1-2 flowers. **Seeds spherical or oval in semitransparent pouches with distinct cellular structure, 0.6-0.7 x c. 0.1 mm. Surface lustrous, pale-brown. 2n = 24, 26.** Native to the circumpolar territories, in mossy, coniferous, rarely leafy woods, lowland forests, on wet humous, stony grounds. Hu, Mo, Ro, Sk, Uk.

**1832. *Chimaphila umbellata* (L.) W. Barton, *Pyrola umbellata* L.** — Hemishrub, stems 10-30 cm high, woody at base, erect, quadrangular, leafy at the bottom half. **Seeds globular in prolonged semitransparent pouches with distinct cellular structure, 0.4-0.6 x 0.1-0.2 mm. Surface lustrous, pale-brown. 2n = 26.** Native to the circumpolar territories in pine, rarely mixed deciduous woods, on mossy, humous,

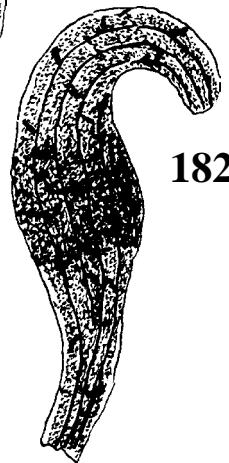




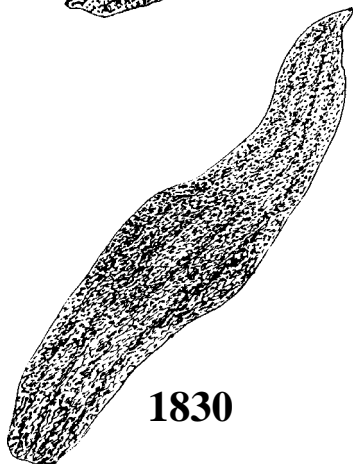
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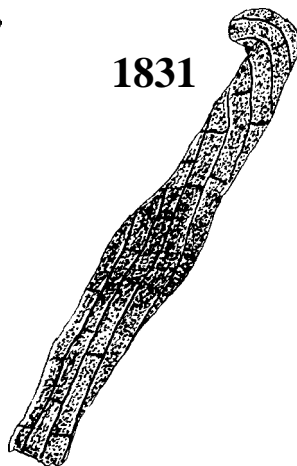
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1832

dryer, sandy and loamy grounds. Br, Hu, Pl, Ro, Sk, Uk.

## 65. MONOTROPACEAE

**1833. *Monotropa hypopitys* L., *M. multiflora* (Scop.) Fritsch, *Hypopitys monotropa* Grantz** — Perennial, saprophyte, ungreen, squamiform plant, stems erect, 20-25 cm, with scaly ovoid leaves. **Seeds  $\pm$  spherical or oval, enclosed in semitransparent pouches with distinct cellular structure, 0.6-0.8 x c. 0.1 mm. Surface lustrous, yellowish-brown.  $2n = 48$ .** Native to the circumpolar territories, in shady coniferous, leafy, mixed, moist woods. Br, Hu, Mo, Pl, Ro, Sk, Uk.

## 66. ERICACEAE

**1834. *Calluna vulgaris* (L.) Hull, *Erica vulgaris* L.** — Small shrub, 15-80 cm high, broomly branched, bare, rarely greyish downy, twigs ascending, dense leafy. **Seeds obovate or ellipsoid, lateral slight compressed, 0.7-0.8 x 0.55-0.65 mm. Surface distinct reticulate, high lustrous, reddish-brown.  $2n = 16$ .** Native to Europe, on pastures, sunny uncalcareous rocks, sands, peatbogs, light oak and pine woods, on shallow, stony, poor soils; rarely cultivated in gardens. Br, Hu, Pl, Ro, Sk, Uk.

**1835. *Erica arborea* L.** — Shrub, up to 1-4 m high with mellow growth, young twigs densely pubescent, flowers on lateral twigs. **Seeds of ellipsoid, obovoid to subglobose, apex and base rounded, c. 0.5 x 0.3 mm. Surface glabrous, lustrous, longitudinal fine ridged, brown.** Native to the Mediterranean, a squeamish species cultivated as an ornamental in gardens.

**1836. *Erica herbacea* L., *E. carnea* L.** — Shrub of small growth, up to 50 cm high, twigs procumbent, multibranched, flowering twigs ascending,  $\pm$  bare. **Seeds ellipsoid, slight compressed, 1.1-1.2 x 0.55-0.65 mm. Surface covered with aerial tubercles, high lustrous, pale-brown.  $2n = 24$ .** Native to the higher mountains of Europe, in pine woods, heathery lands, rocks, on dry, stony grounds; in the Carpathians rarely cultivated as an ornamental in gardens and rock-gardens. Ro, Sk.

**1837. *Erica tetralix* L.** — Dense branched shrub, 20-70 cm high, stemlets ascendent, twigs half-erect, downy when young. **Seeds oval, lateral fine compressed, 0.3-0.4 x 0.2-0.3 mm. Surface faint**

**reticulate, slight lustrous, yellowish-brown.  $2n = 24$ .** Native to western European bogs and moorlands, on damp, sandy or peaty acid soils, a calcifuge; into the Carpathians rarely hauling with forest seeds and planting stocks.

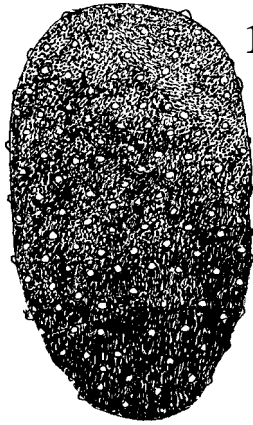
**1838. *Bruckenthalia spiculifolia* (Salisb.) Rchb., *Erica spiculifolia* Salisb.** — Dwarfed shrub, up to 25 cm high, with ascending twigs, pubescent in youth. **Seeds ellipsoid or ovoid,  $\pm$  roundish in transversal section, 0.4-0.6 x 0.2-0.4 mm. Surface longitudinal shallow furrowed, lustrous, reddish-brown.  $2n = 36$ .** Native to the Balkan Peninsula, Asia Minor, on grassy slopes, light woods, in montane to subalpine zones. Ro.

**1839. *Rhododendron arboreum* J. E. Sm.** — About 2-3 m high shrubs, evergreen, flowers red or violet. **Seeds elliptic-obovoid with membranous wing around seed, 2-3.6 x 1-1.2 mm. Surface furrowed, lustrous, brown.  $2n = 26$ .** Originally growing in the Himalayas in light forest; cultivated in gardens and parks in many cvs, a shadow-demanding species.

**1840. *Rhododendron caucasicum* Pall., *Azalea caucasica* Kuntze** — Shrub, evergreen, up to 1-5 m high, procumbent, leaves oblong-oval, with bended margins. **Seeds ellipsoid, with a semitransparent margin around or on one side, lateral compressed, 2.2-2.8 x 0.6-1 mm. Surface longitudinal fine striate, lustreless, pale-brown.** Native to the Caucasus, in montane and subalpine zones (1600-3000 m), in leafy forests; in the Carpathians very rarely cultivated in parks, in cooler mountain areas.

**1841. *Rhododendron ferrugineum* L.** — Evergreen, dense up to 1 m high shrub, young leaves twisted, beneath sides of the leaves rusty scaled. **Seeds prolonged obovoid, surrounded with membranous wing, 1-1.2 x 0.3-0.4 mm. Surface fine furrowed, lustrous, yellowish-brown.  $2n = 36$ .** Native to the mountains in western Europe, in alpine and subalpine zones, in thickets on moister soils rich in humous, somewhat calcifuge.

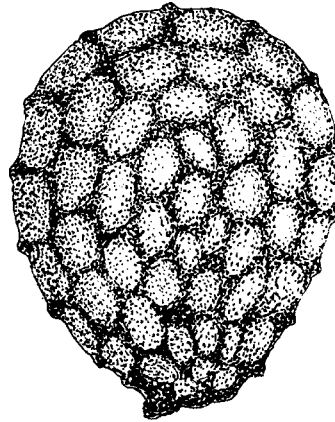
**1842. *Rhododendron fortunei* Lindl.** — Shrub, up to 4 m high, flowers pinkish-violet, fragrant, 7-9 cm in diam. **Seeds oblong-obovoid, apex narrowed and splitted, broad winged, 3.2-3.8 x 1.2-1.4 mm. Seeds surface lustrous, glabrous, reddish-brown, wing surface longitudinal shallow furrowed, pale-brown.** Native to eastern China; in the Carpathians rarely cultivated as an ornamental in parks.



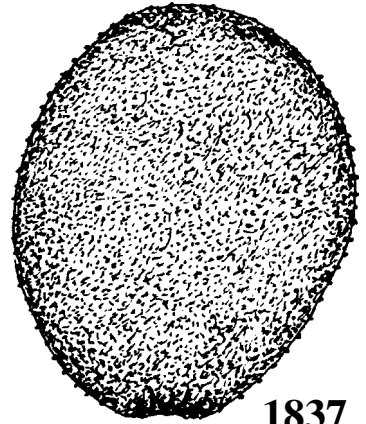
1836



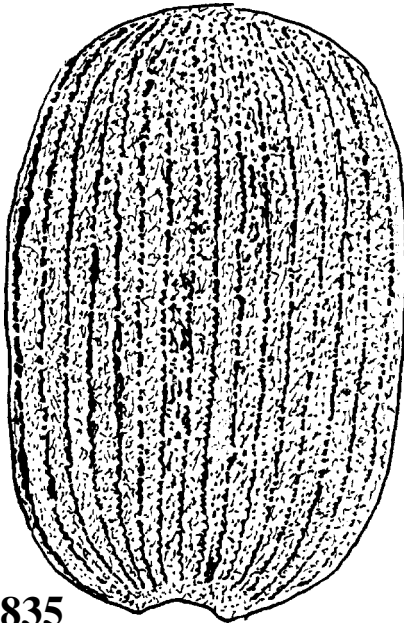
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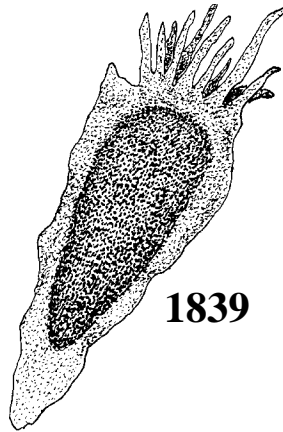
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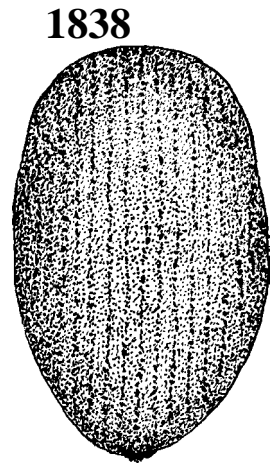
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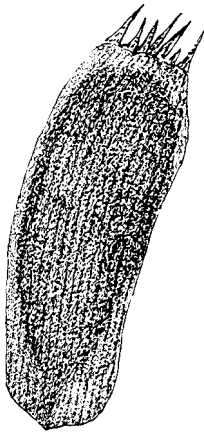
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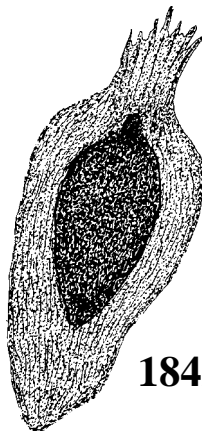
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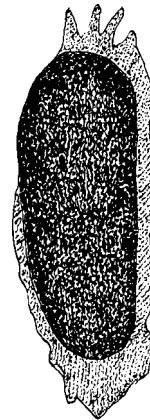
1838



1841



1842



1840



**1843. *Rhododendron hirsutum* L.** – Very twiggy shrub reaching a height of up to 50 cm in mountains and a high of up to 100 cm in parks. **Seeds prolonged cylindric, placed in membranous bag, 1-1.2 x 0.3-0.4 mm. Surface of transparent bag with visible structure of cells, slight lustrous, pale-brown.**  $2n = 26$ . Native in Alps in alpine and subalpine thickets, open woods and scrubs, screes and stony slopes, calcicole; in the Carpathians scarcely naturalized. Pl, Ro, Sk.

**1844. *Rhododendron japonicum* (A. Gray) Suring.** – Shrub, up to 2 m high, flowers orange to intense red, 5-6 cm in diam. **Seeds ovoid, broad winged with splitted apex and  $\pm$  truncate bottom, 2.5-3.1 x 1.3-1.5 mm. Surface of the wing pale-brown, that of the seed little darker, longitudinal shallow furrowed, lustrous.** Native to Japan; in the Carpathians rarely cultivated, mostly in hybrid forms.

**1845. *Rhododendron kotschy* Simonk.** – Shrub, up to 50 cm high, poorly branched. **Seeds  $\pm$  elliptic, lateral compressed, 0.65-0.75 x 0.25-0.35 mm. Surface longitudinal furrowed, faint lustrous, orange-brown.** Native to the Balkan Peninsula and the East Carpathians, in rocky and grassy stands of the alpine zone. Ro, Uk.

**1846. *Rhododendron luteum* Sweet, *R. flavum* (Hoffm.) G. Don, *Azalea pontica* L.** – Shrub, deciduous, up to 4 m high, young twigs and leaves downy, flowers yellow or orange. **Seeds elliptic in semitransparent membranous pouches of irregular shape, 3-3.5 x 1.3-1.5 mm.** Native to Asia Minor, eastern Europe and the Caucasus, in oak-pine woods, on moist places; in the Carpathians rarely cultivated as an ornamental. Br, Pl, Sk, Uk.

**1847. *Rhododendron maximum* L., *R. purpureum* G. Don, *R. purshii* Donn** – Robust tree, up to 12 m high, bearing white flowers in June-July. **Seeds elliptic, with a distinct rests of the membranous bag on both ends, 1.5-1.9 x 0.5-0.6 mm. Surface furrowed, lustrous, dark- or reddish-brown.**  $2n = 24, 26$ . Native to North America, grown in parks in many cvs.

**1848. *Rhododendron molle* Miq., *Azalea mollis* Bl., *R. sinense* Sweet** – Shrub, up to 1.5 m high, leaves deciduous. **Seeds elliptic, winged all around seed, wing irregular, 2.7-3.1 x 1.3-1.6 mm. Surface very fine furrowed, lustrous, yellowish-brown.**  $2n = 26$ . Originally growing in China; cultivated as a room

azalea in many cvs and hybrids with *R. japonicum* and *R. occidentale*.

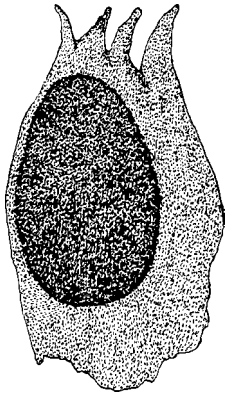
**1849. *Rhododendron myrtifolium* Schott et Kotschy** – Shrub, evergreen, up to 50 cm high, leaves 1-2 cm, obtuse, crenulate, corolla, clear-pink. **Seeds ellipsoid, lateral compressed, 0.7-0.9 x 0.35-0.45 mm. Surface distinct furrowed and ribbed longitudinal, faint lustrous, yellowish-brown.** Native to mountains of the eastern and southern Carpathians, Bulgaria and Macedonia, on shady rocks and stony slopes. Ro, Uk.

**1850. *Rhododendron ponticum* L.** – Shrub or tree, evergreen, up to 1-5 m high, leaves oblong-lanceolate, lustrous, dark-green, flowers violet-pinkish, c. 5 cm in diam. **Seeds elliptic, with a distinct rests of the membranous bag at both ends, 2-2.4 x 0.45-0.55 mm. Surface fine longitudinal furrowed, lustrous, dark-brown.** Native to the Black Sea coasts, the Caucasus and the Balkan Peninsula, altitude up to 2000 m, on calcifugous stands; in the Carpathians cultivated in parks.

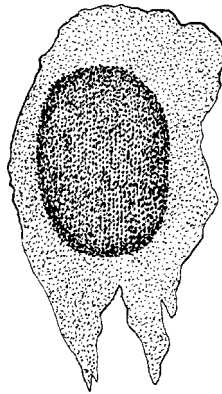
**1851. *Ledum palustre* L.** – Evergreen shrub, young twigs rusty downy. **Seeds in prolonged spindleform transparent pouches with distinct cellular structure, proper seed also spindleform-shaped, 1.6-2 x 0.2-0.3 mm. Surface smooth, high lustrous, pale reddish-brown.**  $2n = 52$ . Native to the circumpolar territories, on peatbogs, shady sandstone rocks, on moist up wet, acid, mossy stands. Pl, Ro, Sk, Uk.

**1852. *Loiseleuria procumbens* (L.) Desv., *Azalea procumbens* L.** – Small, carpetly procumbent shrub, flowering twigs ascending, 2-3 cm high. **Seeds ellipsoid or ovoid,  $\pm$  roundish in transversal section, apex slight narrowed, 0.4-0.5 x 0.25-0.35 mm. Surface distinct reticulate, slight lustrous, yellowish-brown.**  $2n = 24$ . Native to the circumpolar territories, at alpine ridges, in moist, acid, poor, non-calcareous, shallow, stony soils. Pl, Ro, Sk, Uk.

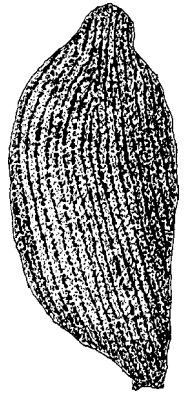
**1853. *Arctostaphylos uva-ursi* (L.) Spreng., *Arbutus uva-ursi* L., *Uva-ursi procumbens* Moench** – Small procumbent shrub, usually created by spacious pillows, stems creeping, 30-150 cm long, twig ends ascending, rooting down. **Seeds half-moon-shaped, lateral compressed, dorsal side broad, ventral narrow, 2.9-3.3 x 1.8-2.2 mm. Surface fine roughen, lustreless, pale-brown.** Native to the circumboreal territories, on rocks and screes, in sunny, dry, slight acid, stony places. Br, Pl, Ro, Sk, Uk.



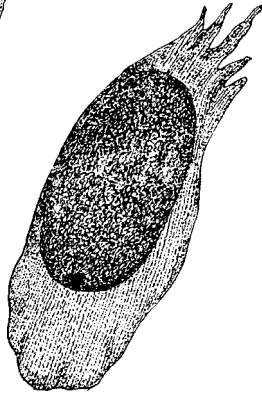
1844



1848



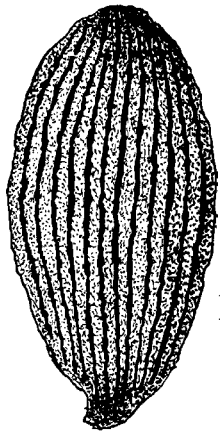
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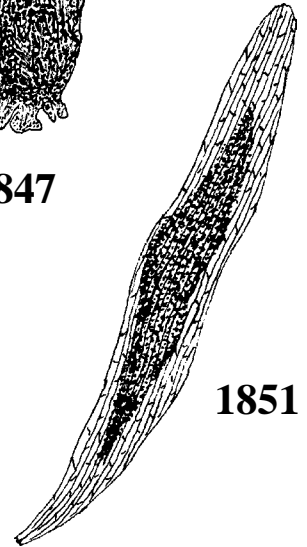
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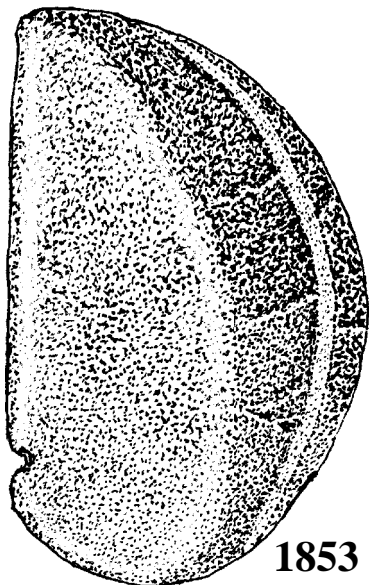
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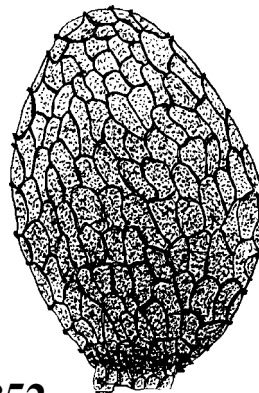
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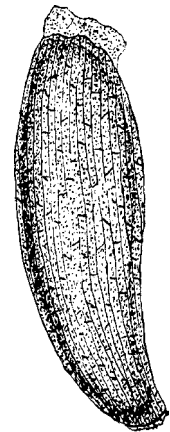
1851



1853



1852



1843

**1854. *Arctous alpina* (L.) Nied., *Arctostaphylos alpina* (L.) Spreng., *Arbutus alpina* L.** — Procumbent, small, carpet shrub, twigs 10 up to 60 cm long, ascending. **Seeds planoconvex, mostly half-moon-shaped, lateral compressed, 2.5-3.5 x 1.5-2.5 mm. Surface slight roughen, lustreless, pale-brown. 2n = 26.** Native to the circumpolar territories, in sunny, stony places, with a long-lasting snow-cover and moist, poor, slight acid and shallow soils. Pl, Sk.

**1855. *Andromeda polifolia* L.** — Tiny shrublet, twigs procumbent, rooting down, ascending,  $\pm$  unbranched. **Seeds ovoid, lateral slight compressed, on bottom side with oval hilum, 1-1.2 x 0.7-0.9 mm. Surface glabrous, high lustrous, chestnut-brown. 2n = 48.** Native to the boreal-circumpolar territories, in peat-bogs and heathery lands with wet, acid, humous stands. Br, Pl, Ro, Sk, Uk.

**1856. *Chamaedaphne calyculata* (L.) Moench, *Lyonia calyculata* Rehb., *Cassandra calyculata* D. Don** — Shrub, up to 15-50 cm high, erect, young twigs and leaves covered with scales. **Seeds  $\pm$  obovate, dorsal side convex, reddish-brown, ventral side rooflike, pale-brown, apex gradually narrowed, bottom truncate, 1-1.3 x 0.6-0.8 mm. Surface smooth, lustrous, one half pale-, second dark-brown.** Native to northeastern Europe, in peaty swamps, wet pine woods, road bumps. Br, Pl, Uk.

**1857. *Kalmia latifolia* L.** — Evergreen shrubs or smaller trees, sometimes up to 12 m high, bearing flowers in April. **Seeds prolonged ovoid, usually more or less curved on one side, dorsal side convex, ventral flat or concave, apex narrowed, acuminate, base with hilum, 0.9-1.2 x 0.3-0.5 mm. Surface longitudinal ridged, glossy, reddish-brown.** Native to North America; in the Carpathians cultivated as an ornamental in parks, uniquely naturalized.

**1858. *Gaultheria shallon* Pursh** — Evergreen shrubs up to 50-150 cm high, erect, reproducing freely by underground rhizomes to form a dense thicket. **Seeds very varied in shape, mostly reniform or subellipsoid, compressed, dorsal side convex, ventral rooflike, 1.2-1.4 x 0.7-0.8 mm. Surface lustrous, reticulate-foveolate, pale- or reddish-brown.** Originally spread from North America; in the Carpathians cultivated for ornament and as cover for game.

**1859. *Pieris japonica* (Thunb.) Don., *Andromeda japonica* Thunb.** — Shrub or a small tree, up to 3 m high, flowering in April - May. **Seeds very different in shape and size, mostly prolonged ellipsoid, slight curved on one side, dorsal side rounded, ventral rooflike, 2-3 x 0.9-1.2 mm. Surface longitudinal faint ridged, lustrous, pale- to reddish-brown.** Native to Japan; in the Carpathians rarely cultivated as an ornamental in parks.

**1860. *Arbutus unedo* L.** — Evergreen, usually a bushy shrub, up to 1.5-3 m high or a tree up to 12 m high, bark fissured, peeling off in small flakes. **Seeds ellipsoid or subreniform, dorsal side convex, ventral deep concave, with small wing on apex side, 2.7-3 x 1.4-1.6 mm. Surface longitudinal reticulate-foveolate, lustrous, chocolate-brown. 2n = 26.** Native to the Mediterranean, at wood margins and rocky slopes; in the Carpathians very rarely planted in parks.

**1861. *Enkianthus campanulatus* (Miq.) Nichols** — Semievergreen shrub or tree up to 10 m high, twigs in whorls. **Seeds prolonged ellipsoid, compressed with many lateral, membranous wings, 3.8-4.2 x 1.2-1.4 mm. Surface reticulate-foveolate, lustrous, pale rusty-brown.** Originally spread from Japan; in the Carpathians cultivated in semishade as an ornamental in parks.

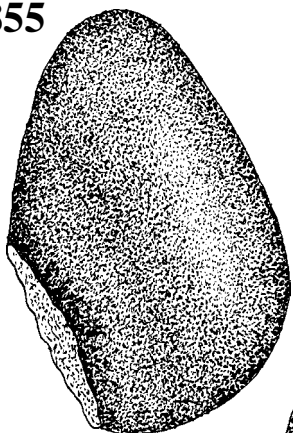
**1862. *Menziesia pilosa* (Michx.) Juss., *M. globularis* Salisb.** — Shrub, up to 2 m high, with elliptical deciduous leaves. **Seeds ellipsoid, in testa envelope prolonged into unmembranous appendages, proper seed in the middle, 1.3-1.8 x 0.4-0.6 mm. Surface longitudinal ridged, lustreless, brown.** Native to northern Asia and North America; in the Carpathians rarely cultivated as an ornamental in parks.

#### 67. VACCINIACEAE

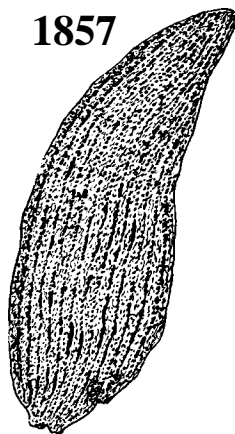
**1863. *Vaccinium corymbosum* L.** — Shrub, with deciduous leaves, up to 40 cm high, with white flowers and blue berries. **Seeds obovoid or ellipsoid, faint compressed, large hilum lateral situated on bottom part, 1.5-1.8 x 0.9-1.1 mm. Surface distinct reticulate, light lustrous, orange-brown. 2n = 48.** Originally growing in the mountains of North America; in the Carpathians experimentally cultivated as a fruit shrub.

**1864. *Vaccinium gaultherioides* Bigelow, *V. uliginosum* subsp. *microphyllum* Lange** — Shrubby only

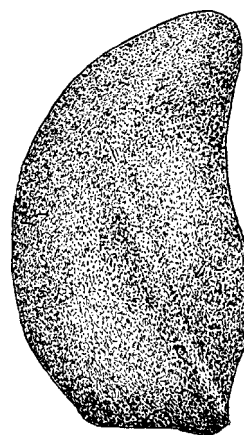
1855



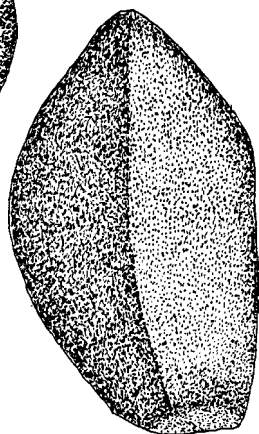
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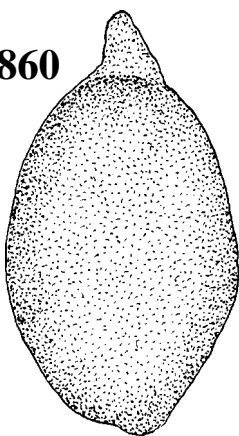
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1856



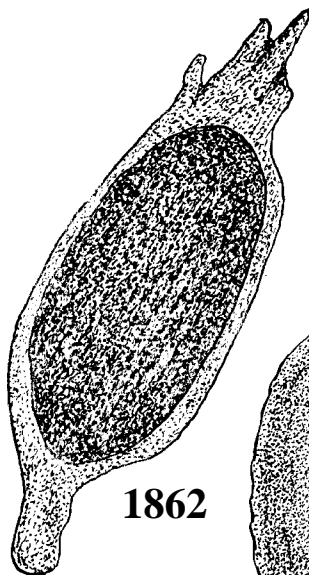
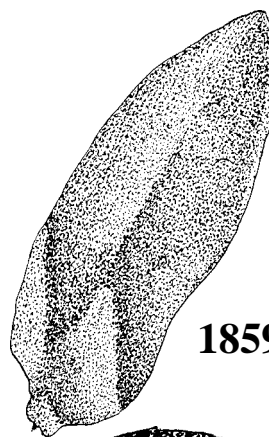
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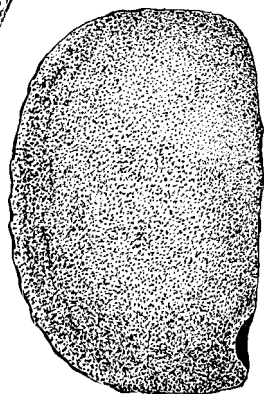
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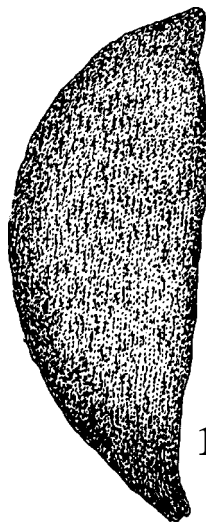
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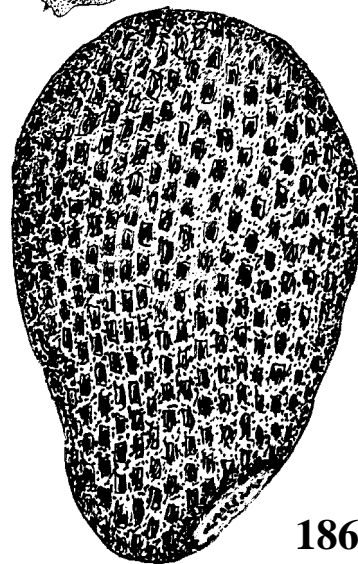
1862



1854



1864



1863

5-15 cm high, procumbent, twiglets thin, leaves small. **Seeds crescent-shaped, lateral slight compressed, 1.4-1.8 x 0.5-0.7 mm. Surface longitudinal breakly furrowed, slight lustrous, orange-brown. 2n = 24.** Native to boreal-circumpolar territories, at high-mountain ridges, in non-calcareous, humous, deep soils. Ro, Sk.

**1865. *Vaccinium macrocarpon*** Aiton — Evergreen, dwarf shrubs, up to 100 cm high, leaves, 8-18 x 3.5-5 mm, oblong, margins slight revolute, berries 10-20 mm wide. **Seeds obovoid, convexo-convex, ventral side with rough rib, apex with small beak, bottom gradually narrowed, 2-2.4 x 1-1.3 mm. Surface longitudinal fine striate, lustreless, purplish.** Native to North America in montane zones; recently introduced into the Carpathians and experimentally cultivated for its edible fruits (Cranberries) as a perspective fruit species. Sk.

**1866. *Vaccinium myrtillus*** L. — Low-growing, up to 50 cm high, dense branched shrublet, twigs creeping, ascending, angular, green. **Seeds slight half-moon-shaped or similar, lateral compressed, 1.2-1.4 x 0.6-0.7 mm. Surface longitudinal shallow furrowed, lustrous, dark-brown. 2n = 24.** Native to boreal-circumpolar territories, in light, humous woods, with dwarf pine, in peatbogs and heathery lands with acid humous soils. Br, Hu, Pl, Ro, Sk, Uk.

**1867. *Vaccinium uliginosum*** L., *V. rubrum* Gilib., *V. ciliatum* Gilib. — Shrub, up to 90-100 cm high, twiglets creeping, rooting down, bare, leaves deciduous. **Seeds crescent-shaped, lateral compressed, dorsal side broader than the ventral one, 1.2-1.5 x 0.6-0.8 mm. Surface longitudinal shallow furrowed, faint lustrous, orange to dark-brown. 2n = 48.** Native to arctic-circumpolar territories, in heathery lands, peatbogs, on moist, poor, acid stands; in mountain areas throughout Carpathians, rare in lowlands. Pl, Ro, Sk, Uk.

**1868. *Vaccinium vitis-idaea*** L., *Rhodococcum vitis-idaea* (L.) Avronin — Low-growing, 10-30 cm high, branched shrublet, twigs ascending, downy in youth. **Seeds crescent-shaped, lateral compressed, dorsal side broader than ventral one, 1.4-1.7 x 0.7-0.8 mm. Surface longitudinal faint furrowed, lustrous, reddish-brown. 2n = 24.** Native to arctic-boreal-circumpolar territories, in dryer wood peatbogs, heathery lands, alpine ridges and pastures; in all Carpathian mountains, an important source of forest fruits.

**1869. *Oxycoccus macrocarpus*** (Ait.) Pers., *Vaccinum macrocarpon* Ait — Shrubs sturdier than *O. microcarpus*, twiglets up to 1 m long, creeping, leaves longitudinal. **Seeds ellipsoid, lateral slight compressed, apex with beak, margin with hem, 1.8-2.2 x 1.1-1.3 mm. Surface coarse, lustrous, pale-brown.** Native to North America; in the Carpathians experimentally cultivated in some places as a fruit-bearing shrub.

**1870. *Oxycoccus microcarpus*** Turcz. ex Rupr., *O. nanum* (Baumg.) Thaisz, *Vaccinium microcarpum* (Turcz. ex Rupr.) Schmalh. — Shrublets, stems up to 30 cm, leaves 3-angularly ovoid. **Seeds slight crescent-shaped or similar, lateral compressed, 1.2-1.4 x 0.5-0.6 mm. Surface longitudinal faint furrowed, lustreless, rusty-brown. 2n = 24.** Native to boreal-circumpolar territories, in heathery lands, on acid, wet stands of subalpine and montane zones, at altitude over 800 m. Pl, Ro, Sk, Uk.

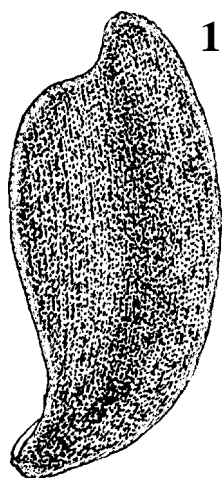
**1871. *Oxycoccus palustris*** Pers., *O. quadripetalus* Gilib., *O. vulgaris* Pursh. — Procumbent shrublet, stemlets up to 80 cm. **Seeds tear-shaped, ± roundish in transversal section, ventral side with longitudinal hem, apex narrowed, bottom with large oval hilum, 1.8-2.3 x 1.1-1.4 mm. Surface distinct reticulate and foveolate, lustrous, orange- to blackish-brown. 2n = 48.** Native to boreal-circumpolar territories, in peatbogs, heathery lands, on wet, poor, acid stands. Pl, Ro, Sk, Uk.

## 68. EMPETRACEAE

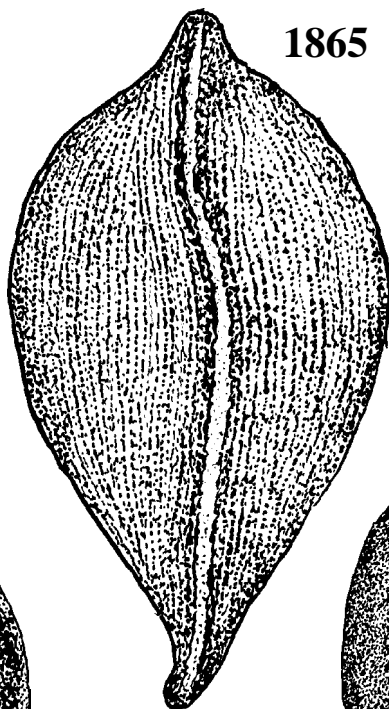
**1872. *Empetrum hermaphroditum*** Hagerup — Low-growing evergreen, hardly 50 cm high, scarcely ramified shrublet, stems decumbent or ascending, not rooting down, young stemlets green. **Stones semiglobose, dorsal side broad, ventral narrow, lateral sides flattish, 2.2-2.5 x 1.4-1.7 mm. Surface rough, dull, pale- to reddish-brown. 2n = 52.** Native to the mountains of Eurasia, in heaths, moors, coniferous forest, stony slopes. Ro, Sk, Uk.

**1873. *Empetrum nigrum*** L. — Shrub, up to 120 cm high, twigs procumbent, patently ramified, arcuate, ascending, often rooting down at the bottom, reddish-brown. **Stones crescent-shaped, with truncate bottom, lateral compressed, 1.4-1.7 x 0.8-0.9 mm. Surface dense reticulate-foveolate, lustrous, black. 2n = 26.** Native to boreal-circumpolar territories, at high mountain shrubby ridges, in heathery lands, woody peatbogs with poor, acid, deep soils. Br, Pl, Ro, Sk, Uk.

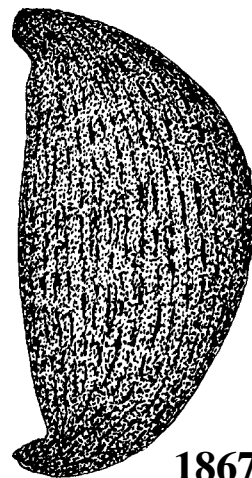




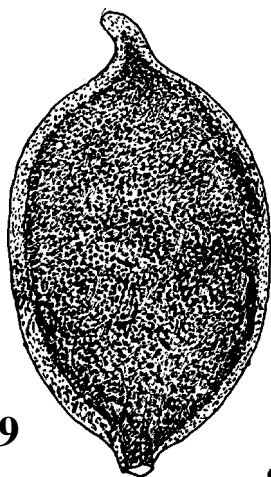
1866



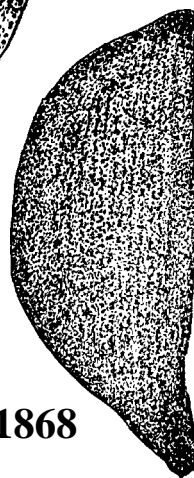
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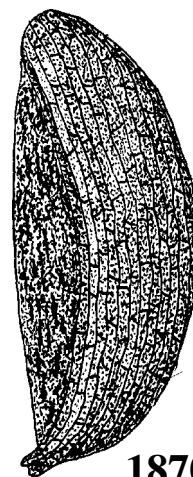
1867



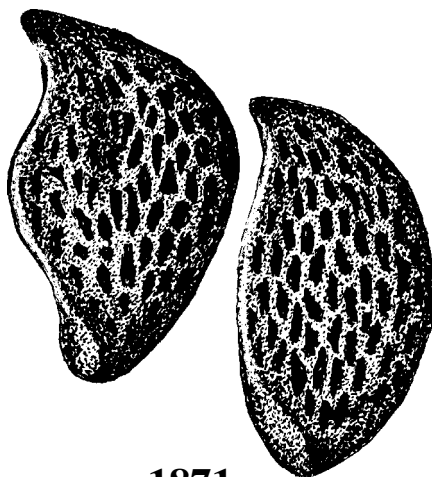
1869



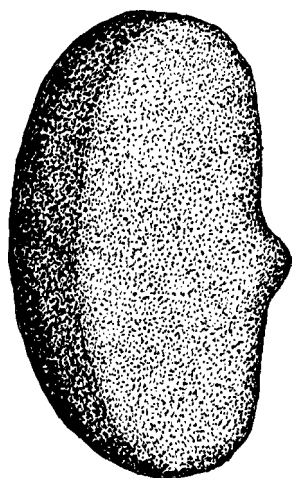
1868



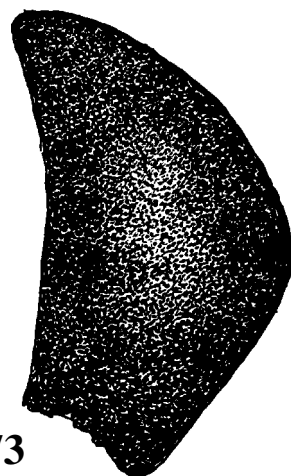
1870



1871



1872



1873

## 69. EBENACEAE

**1874. *Diospyrus kaki* L. fil.** — Shrub or tree, 10-15 m high, leaves oval, leathery, 8-16 cm long, flowers whitish-cream, fruits up to 8 cm in diam., light-orange. **Seeds  $\pm$  half moon, planoconvex, hilum on ventral side very long, 14-16 x 9-11 mm. Surface waved, faint lustrous, dark-brown.** Native to Japan and Korea; in the Carpathians cultivated in orchards and parks, in the warmest localities, for its fruits and as an ornamental. Hu, Uk.

**1875. *Diospyros lotus* L.** — Tree, up to 20 m high, leaves prolonged elliptical, thinner, 5-14 cm long. **Seeds sectorial, crescent-shaped, strong compressed, dorsal side narrow and convex, ventral rooflike, flattish, 8.4-9 x 4.8-5 mm. Surface wrinkly or humpy, lustrous, chocolate-brown.** Native to central Asia, one of the costly woody species; in the Carpathians planted experimentally in woods and parks, in the warmest areas.

**1876. *Diospyros virginiana* L.** — Shrub, up to 15-20 m high, leaf margins ciliate, flowers yellowish-green. **Seeds sectorial, crescent-shaped, planoconvex, strong compressed, dorsal side narrow, convex, ventral side rooflike, flat, 14-16 x 7-8 mm. Surface wrinkly, lustrous, chocolate-brown.** Native to Central America, one of the costly woody species; in the Carpathians experimentally planted in parks and woods, in the warmest areas.

## 70. ACTINIDIACEAE

**1877. *Actinidia arguta* (Sieb. et Zucc.) Miq.** — High liana with deciduous leaves, up to 25 m long, twigs light-brown. **Seeds obovoid, lateral compressed, bottom with long, narrow hilum, 2.3-3 x 1.7-2 mm. Surface reticulate, lustreless, pale-brown.** Native to Japan, Korea, commonly cultivated for its fruit; in the Carpathians planted in parks and orchards in the warmest areas. Mo, Ro, Uk.

**1878. *Actinidia chinensis* Planch.** — Quickly growing liana, up to 8 m high, leaves round or broad ovoid, up to 15 x 10 cm. **Seeds obovoid, with narrowed and curved bottom, 2.1-2.3 x 1.3-1.5 mm. Surface reticulate, lustrous, brown.** Native to central and southwestern China; in the Carpathians rarely cultivated in parks and orchards for aromatic, acidulated edible fruits, with a high capacity of vitamins.

**1879. *Actinidia kolomikta* (Rupr.) Maxim.** — Covering liana, up to 7 m long, very ornamental and hardy woody plant. **Seeds obovoid, lateral compressed, apex rounded, bottom narrowed, with longish hilum, 1.8-2.4 x 1.1-1.5 mm. Surface reticulate, slight lustrous, pale-brown.** Native to northeastern Asia (China, Japan), commonly cultivated for its fruit; in the Carpathians cultivated in the warmest areas, rare in parks and orchards. Mo, Ro, Uk.

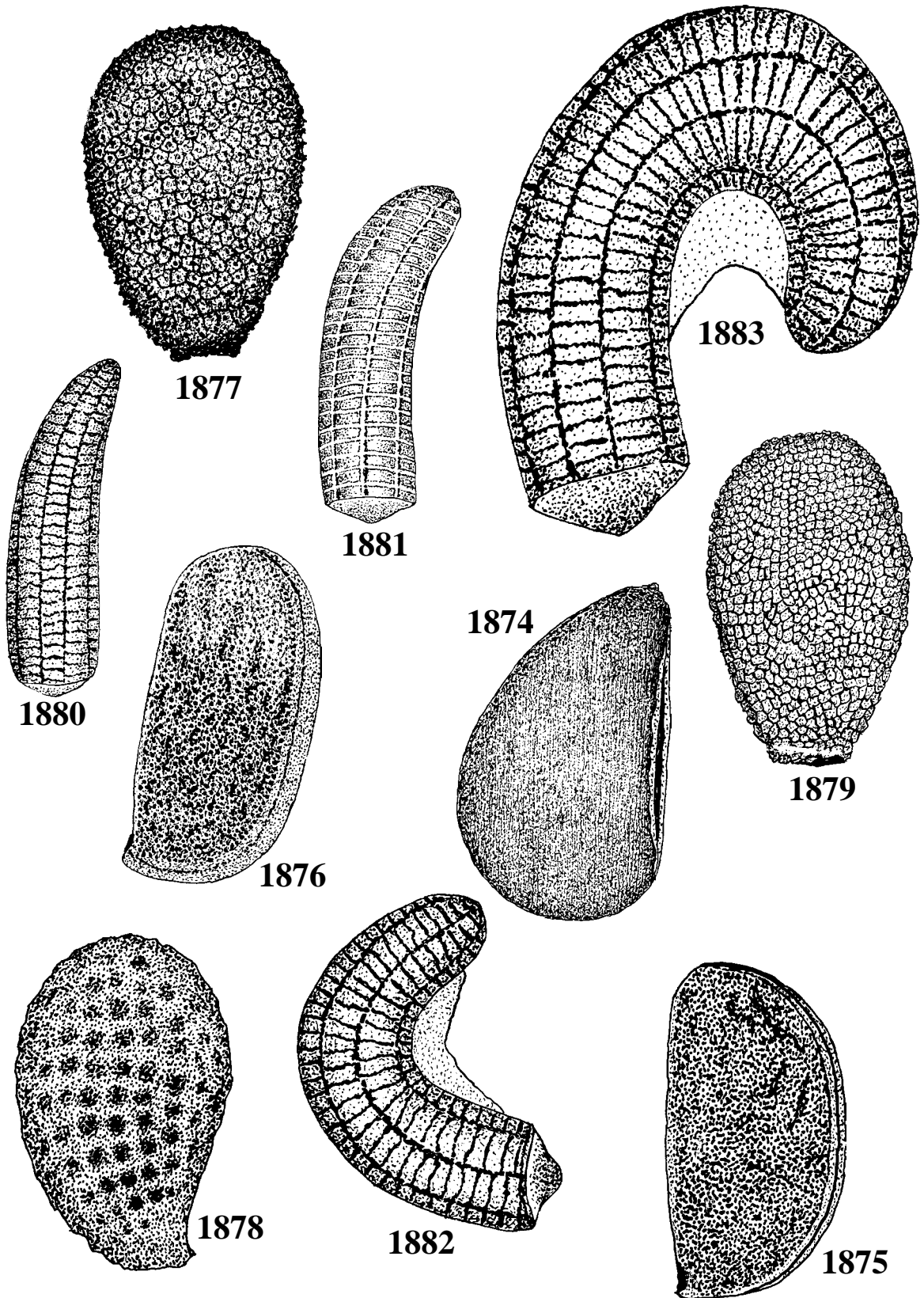
## 71. ELATINACEAE

**1880. *Elatine alsinastrum* L., *E. verticillata* Lam.** — Annual up to perennial, water or muddy plant, stems 10-80 cm long, erect or ascending, simple or branched bellow and there rooting down. **Seeds cylindric, mostly straight or faint bended on apex, 0.7-0.9 x c. 0.2 mm. Surface longitudinal and transversal reticulate-foveolate, lustreless, brown.** Native to Eurasia, in shallow, stagnant waters of ditches, ponds and boundaries, muddy banks, on non-calcareous, humous stands. Hu, Mo, Pl, Ro, Sk, Uk.

**1881. *Elatine hexandra* (Lapierre) DC., *E. paludosa* Seub.** — Annual, or short-lived perennial, sunken up to 20 cm, swamp 2-10 cm, dense tufted, stems crawling, rooting down, with erect up to 10 cm long stems. **Seeds narrow elliptic, slight curved, base acute, hilum conical, 0.7-0.9 x 0.2-0.3 mm. Surface scalariform, interspace of reticulum 4-angled, grey nut-brown.  $2n = 72$ .** Native to western and central Europe, banks of stagnant, stripped bottoms and slowly flowing waters, on humous, sandy stands. Hu, Pl, Ro, Sk.

**1882. *Elatine hungarica* Moesz, *E. campylosperma* Seub.** — Annual, stems up to 20 cm long, creeping, rooting down, with short, ascending, flowering twigs. **Seeds cylindric, horseshoe-bended, with colourless membrane between arms, hilum conical, 0.7-0.9 x 0.15-0.2 mm. Surface scalariform, lustreless, brown.** Native to eastern Europe, in shallow, stagnant waters, on muddy banks. Hu, Mo, Ro, Sk, Uk.

**1883. *Elatine hydropiper* L.** — Annual, 2-20 cm long, tender, stem creeping, rooting down, with short, ascending twigs. **Seeds cylindric disproportional horseshoe-bended, with colourless membrane between arms, hilum conical, 0.9-1 x 0.2-0.3 mm. Surface scalariform, lustreless, brown.  $2n = 40$ .** Native to Eurasia, in shallow, stagnant waters, muddy, non-calcareous, sandy soils. Hu, Mo, Pl, Ro, Sk, Uk.



**1884. *Elatine triandra*** Schkuhr, *E. callitrichoides* (W. Nyl.) Kaufm. — Annual, a water plant, stems much-branched, tender, creeping and rooting down, up to 20 cm long, water outside only 1-5 cm. **Seeds cylindric, straight at bottom and distinct bended at apex, 0.5-0.6 x 0.1-0.15 mm. Surface reticulate to scalariform, buff-brown. 2n = 36, 40.** Native to central, northern and eastern Europe, on muddy and sandy banks of stagnant waters. Hu, Pl, Ro, Sk, Uk.

## 72. TILIACEAE

**1885. *Tilia cordata*** Mill., *T. parvifolia* Ehrh., *T. ulmifolia* Scop. — Tree, seldom shrub, up to 30 m high, corona broad, spreading, young twigs  $\pm$  glabrous. **Fruits nutlets, globose to broad obovoid, 5-6.5 x 4-5 mm. Surface dense hairy, smooth. Seeds obovate, 3.4-3.8 x 3-3.4 mm. Surface without furrows, one oval area glabrous, darker, the rest of the area rough, brown. 2n = 82.** An European element. It grows on nutrient-rich soils, in warmer areas, the best honey-yielding plant; throughout the Carpathians.

**1886. *Tilia glabra*** Vent., *T. americana* L. p. p., *T. nigra* Borkh. — Tree, up to 40 m high, twigs glabrous, leaves shortly stalked. **Fruits nutlets, downy, very hard pericarp, ribs indistinct or only slight distinct, 9-10 x 8-9 mm. Seeds ovoid, rough ellipsoid up to globose, with a irregular furrow, 5.5-6.5 x 4-5 mm. Surface dark-brown. 2n = 82.** Native to North America; in the Carpathians often cultivated in alleys and parks.

**1887. *Tilia mandshurica*** Rupr. et Maxim. — Tree, up to 20 m high, with dense broad oval corona, bark dark-grey, young twigs and buds tomentose, leaves cordate, with dentate margins. **Fruits nutlets, spherical, smooth or with 5 longitudinal ribs, 8-12 x 8-10 mm. Surface dense downy, dull, yellowish-brown. Seeds ovoid, apex acuminate, 5-6 x 3.5-4.6 mm. Surface glabrous.** Native to northeastern Asia; very rarely cultivated in the Carpathians in parks as a decorative and honey-bearing tree.

**1888. *Tilia petiolaris*** DC. — Tree, up to 25 m high, with glabrous light bark and thin twigs, young twigs downy with short stellar hairs, older twigs dark-brown, leaves broadly ovoid, minutely dentate. **Fruits nutlets, spherical with 5 convex walls and 5 longitudinal furrows, 6.5-8 mm in diam. Surface dense downy, dull, greyish-brown.** Native probably to southeastern Europe and southwestern Asia; in the Carpathians often cultivated in parks as resistant against dryness and winds, mostly in tree-rows.

**1889. *Tilia platyphyllos*** Scop., *T. cordifolia* Besser — Tree, up to 40 m high, branches spreading. **Fruits nutlets, globose or obovate, with 4 to 5 weak or strong distinct ribs, 8-10 x 6.5-7.5 mm. Surface downy, greyish. 2n = c. 80, 82.** Native to southern and central Europe, on stony slopes, common in many forms as town verdure; in all Carpathian territories.

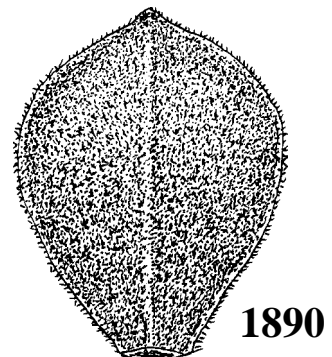
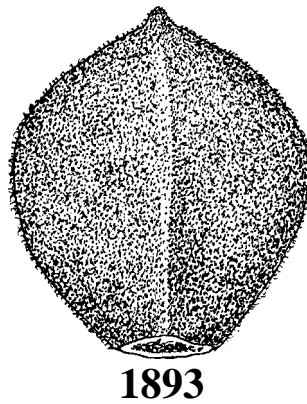
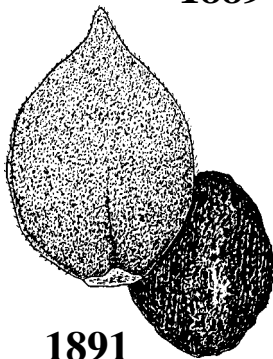
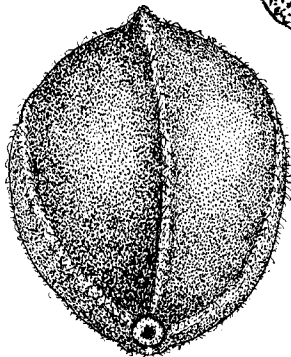
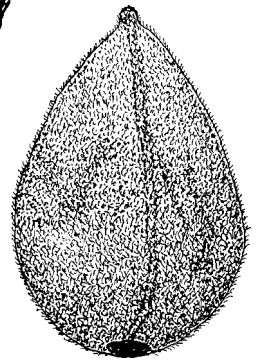
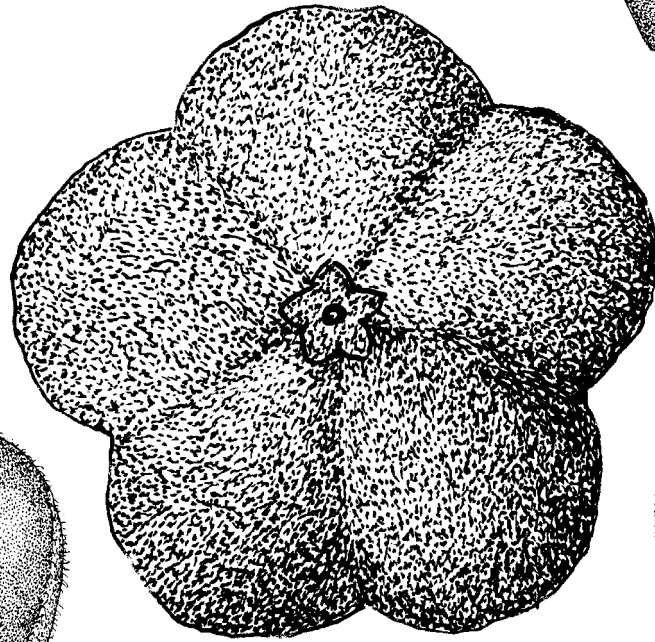
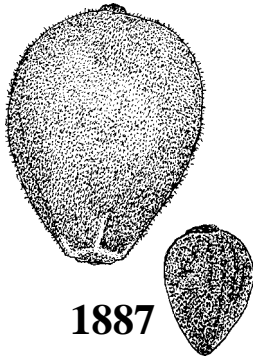
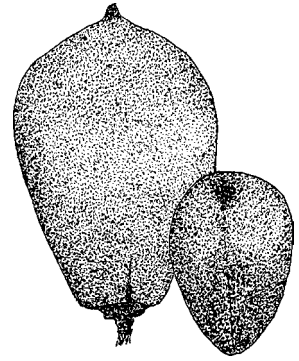
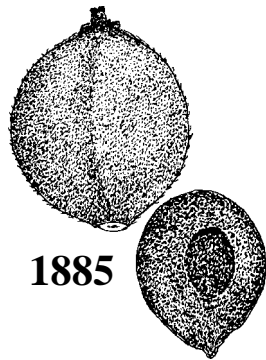
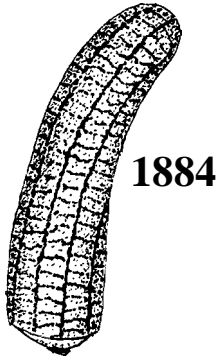
**1890. *Tilia rubra*** DC., *T. dasystyla* Stev. — Tree, similar to *T. platyphyllos*, but with red twigs in winter, leaf stalks hirsute. **Fruits nutlets, variable in shape, mostly rounded or elliptical, with distinct or indistinct ribs, 10-12 x 5-8 mm. Surface dense downy, dull. 2n = 82.** Native to southeastern and eastcentral Europe, distribution uncertain, because of its confusion with *T. platyphyllos* mostly in mixed forests. Hu, Ro.

**1891. *Tilia tomentosa*** Moench, *T. argentea* Desf. — Tree, up to 30 m high, corona broad conical, young twigs downy. **Fruits nutlets, ellipsoid to globose, with small beak at the apex, 7-10 x 5-6.5 mm. Surface dull, verrucose, pubescent, dark-brown. Seeds oval, concavo-convex, 5-6 x 4-5 mm. Surface fine wrinkly, lustreless, dark-brown. 2n = 82.** Native to the eastern Mediterranean; in the Carpathians often planted elsewhere for ornament. Hu, Mo, Ro, Sk, Uk.

**1892. *Tilia x euchlora*** C. Koch — Tree, up to 25 m high, corona ovoid pyramidal, twigs yellowish-green. **Fruits nutlets, ovate, apex slight narrowed, with 4-5 distinct ribs, 8-9 x 5.2-6 mm. Surface smooth or slight ribbed, downy. 2n = 82.** Probably a hybrid of *T. cordata* x *dasystyla*; plentifully cultivated, mostly in urban streets as ornamental, especially in central Europe and throughout the Carpathians.

**1893. *Tilia x vulgaris*** Hayne — Perennial, up to 40 m high; branches spreading. **Fruits nutlets, subglobose or broad ovate, rounded at the apex with small beak on top, 8-9.6 x 7-8 mm. Surface dense tomentose, dull, slight ribbed, greyish-brown.** Native to Europe, a natural hybrid of *T. cordata* x *platyphyllos*; planted in parks and gardens in all Carpathian territories.

**1894. *Sparmannia africana*** L. fil. — Spreading shrub or tree, with large nice cordate leaves and white flowers in clusters. **Fruits nutlets, rhomboid, ellipsoid or obovoid, dorsal side convex, ventral convex or flat, with longitudinal furrow from bottom up to apex, 3.2-3.6 x 2.2-2.4 mm. Surface tuberculate,**



lustreless, dark-brown. Native to South Africa; in the Carpathians rarely cultivated as lodgings shrub; needs shady and semishady habitats.

### 73. THEACEAE

**1895. *Thea sinensis* L., *Camellia sinensis* L.** — Divergent shrubs, 1-2 m high, leaf simple, with expressive venation, whole-leaved or shallowly dentate. **Seeds mostly spherical, 1-1.7 mm in diam. Surface smooth, faint lustrous, brown.** Originally perhaps from *Thea assamica* Mast., now cultivated in large extent for leaves collection; in the Carpathians grown only in gardens and interiors for its nice flowers.

### 74. MALVACEAE

**1896. *Malva alcea* L., *M. fastigiata* Cav., *Alcea palmata* Gilib.** — Perennial, up to 120 cm high, stems erect,  $\pm$  poorly branched, scattered hairy below, stellate-pubescent above. **Mericarps (up) subfalcate or reniform with ridge on dorsal side, lateral faces ribbed, 2.4-2.8 x 2.2-2.4 mm. Seeds (down) subspherical, flattish, 2.2-2.5 x 2-2.2 mm. Surface glabrous, smooth, dark reddish-brown.  $2n = 84$ .** Native to most of Europe, on embankment, waste grounds, coastal shrubberies, sunny slopes, vineyards; throughout the Carpathians.

**1897. *Malva crispa* (L.)** — Annual up to perennial, similar to *M. verticillata*, up to 2 m high, but leaves curled. **Mericarps (up) subcircular, glabrous, dorsal side with one longitudinal ridge, lateral faces ribbed, 2.01-2.3 x 2.1-2.3 mm. Seeds (down) reniform to oval, 1.8-2 x 2-2.2 mm. Surface smooth, dull, reddish-brown.  $2n = c. 112$ .** Mutant of *M. verticillata*; cultivated as an ornamental, fodder and also as a medical plant. Mo, Pl, Ro, Sk, Uk.

**1898. *Malva excisa* Rchb., *Malva alcea* subsp. *excisa* (Rchb.) Holub** — Perennial, a plant without musk stink, covered with stellar adpressed hairs, stems 40-120 cm high. **Mericarps reniform, lateral slight compressed, 2.4-2.9 x 1.9-2.2 mm. Surface of dorsal part covered with many straight prickles. Proper seeds smooth, lustreless, dark-grey.** Native to eastern Europe, rare on slopes, in waste places and near dwellings. Mo, Uk.

**1899. *Malva mauritiana* L., *Malva sylvestris* subsp. *mauritania* (Scop.) Thell.** — Perennial, up to 150 cm high, similar to *M. sylvestris*, but stems rough, leaves large  $\pm$  bare. **Mericarps subcircular, 3.1-3.5 x**

**2.7-2.9 mm. Surface dorsal glabrous, reticulate, lateral faces glabrous. Seeds globose or reniform, flattish, 1.9-2.1x1.9-2.1 mm. Surface smooth, fine verrucose, dull, blackish-brown to black.  $2n = 42$ .** Native to the Mediterranean, in gardens, orchards and meadows as weed; in the Carpathians often cultivated as an ornamental. Mo, Pl, Sk, Uk.

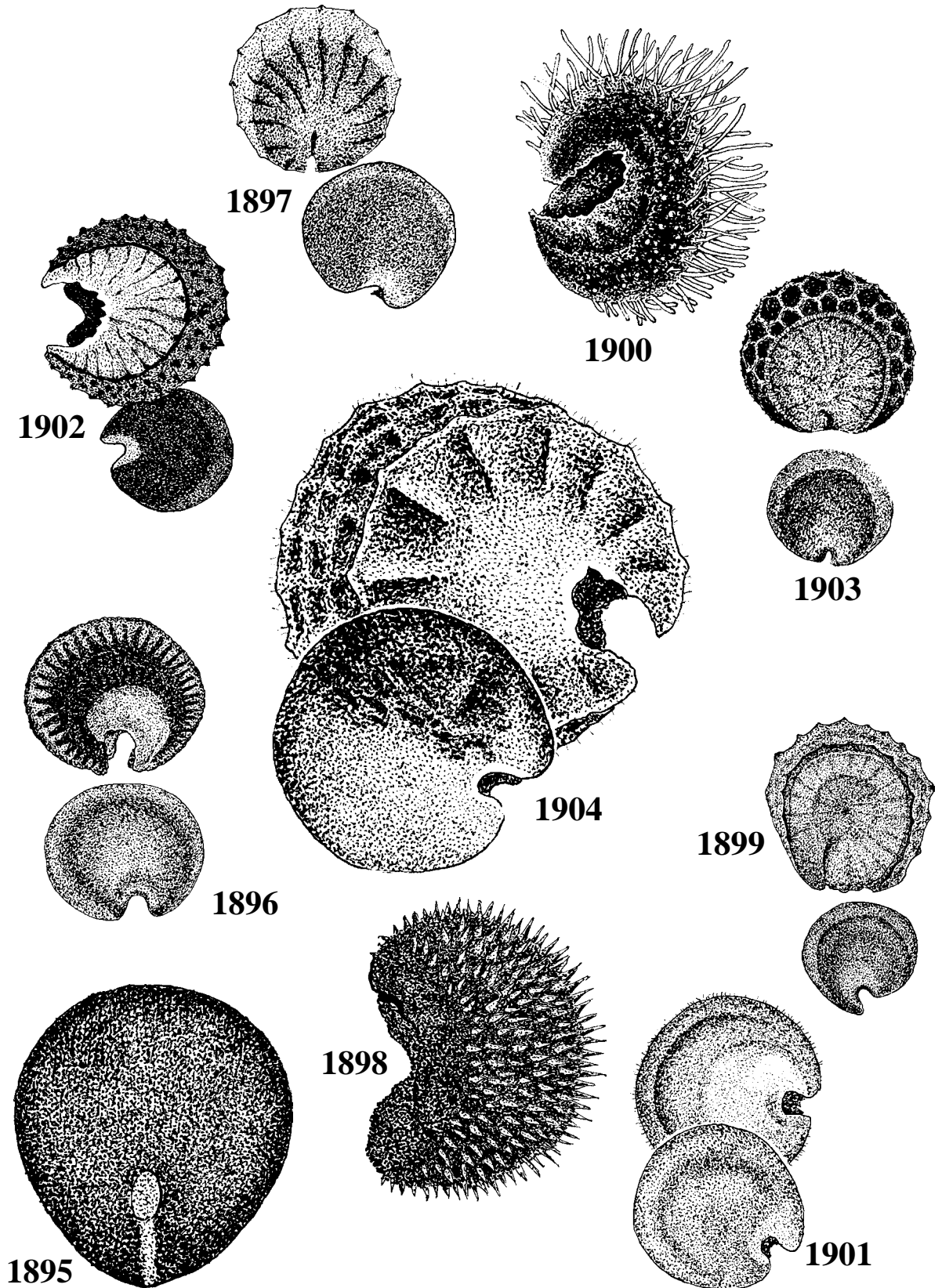
**1900. *Malva moschata* L., *Alcea pinnatifida* Gilib., *Bismalva moschata* (L.) Medik.** — Perennial, similar to *M. alcea*, but stems only with simple hairs. **Mericarps one-seeded, elliptic to reniform, indehiscent, 1.6-1.7 x 2-2.2 mm. Surface with long white hairs.  $2n = 42$ .** Native to southern Europe, in semidry turfs, meadows and pastures, rather calcifugous in warm areas, old medicinal plant; nearly in all Carpathian territories.

**1901. *Malva neglecta* Wallr., *M. vulgaris* Ten.** — Annual, mostly dense stellate-pubescent, stems procumbent or ascendent, 15-60 cm high. **Mericarps (up) globose or reniform, 2-2.4 x 1.8-2 mm. Surface pubescent. Seeds (down)  $\pm$  circular, flattish, dorsal part rounded, 1.8-2 x 1.7-1.9 mm. Surface fine verrucose, greyish-brown.  $2n = 42$ .** Native to Eurasia, in weedy places, along paths, embankments, in nitrogenous soils; throughout the Carpathians.

**1902. *Malva nicaeensis* All., *M. montana* Grossh.** — Annual, stems 20-50 cm high, covered with hairs seated on small humps. **Mericarps (up) spherical or reniform, dorsal side reticulate-tuberculate, lateral side ribbed, 2.4-2.7 x 2.6-2.9 mm. Seeds (down) reniform or spherical, lateral compressed, 1.9-2 x 1.9-2 mm. Surface glabrous, dull, dark reddish-brown.** Native to eastern Europe, rarely growing near fences, buildings, along roadsides, waste places. Ro, Uk.

**1903. *Malva pusilla* Sm., *M. borealis* Wallman** — Annual up to perennial, stems decumbent or ascendent, 15-40 cm high, branched. **Mericarps (up) subcircular, 2.3-2.6 x 2.2-2.5 mm. Surface faint hairy, strong reticulate, lateral side glabrous, ribbed. Seeds (down) subcircular to reniform, flattish, 1.7-2 x 1.5-1.8 mm. Surface fine verrucose, dull, greyish to dark-brown.  $2n = 42, 76$ .** Native to Eurasia, as weed in gardens, orchards, waste places, roadsides, pastures, in warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**1904. *Malva sylvestris* L., *M. erecta* Gilib., *Althaea sylvestris* (L.) Alef.** — Biennial or perennial, with



dense, simple or stellate pubescent, stems 20-150 cm high or long, erect or ascendent, ramified below. **Mericarps (up) subcircular, dorsal side flat, angles sharp, 2.2-2.6 x 2.4-2.8 mm. Surface glabrous or pubescent, strong reticulate. Seeds (down) circular, flattish, dorsal side broader than ventral one, 1.7-1.9 x 1.7-1.9 mm. Surface smooth, dull, dark-brown. 2n = 42.** Native to Euro-Siberia, on roadsides, in waste places, near fence shrubberies, at altitudes up to 1500 m; throughout the Carpathians.

**1905. *Malva verticillata* L.** — Annual up to perennial, scattered shortly hirsute and glandular, stems erect, simple or ramified, up to 2 m high. **Mericarps (up) subcircular, dorsal side reticulate, hairy, 2-2.4 x 1.9-2.3 mm. Surface lateral faces glabrous, radial ribbed. Seeds (down) rounded or reniform, flattish, 1.7-2.1 x 1.8-2.2 mm. Surface smooth, dull, dark reddish-brown. 2n = c. 84.** Native to eastern Asia; in the Carpathians rarely cultivated as an ornamental, for fodder or as a medical plant.

**1906. *Lavatera thuringiaca* L.** — Perennial, stems, from stellate pubescent, 60-100 cm high, erect, ramified. **Mericarps globose or elliptic, ventral margin open, 2.2-2.8 x 2.8-3.2 mm. Surface dorsal side smooth but keeled, lateral faces smooth or slight ridged, angles rounded.** Native to Eurasia, on sunny, shrubby slopes, at forest edges, in vineyards, coastal deserts, screes in warmer areas; throughout the Carpathians.

**1907. *Lavatera trimestris* L.** — Annual, stems erect or ascending, 60-120 cm high, more or less strigose, hairs simple or stellate. **Mericarps reniform, flattish, 2.5-3 x 3.3-3.7 mm. Surface dorsal side longitudinal ridged, lateral faces ribbed. 2n = 14.** Native to the Mediterranean; in the Carpathians cultivated as ornamental plant, in gardens, locally naturalized.

**1908. *Althaea armeniaca* Ten.** — Perennial, stems 60-150 cm high, softly, dense stellate-pubescent. **Mericarps (up) rounded to reniform, flattish, dorsal side with or without longitudinal ridge, lateral faces slight sulcate, 2.8-3.2 x 3-3.4 mm. Surface dorsal side hirsute. Seeds (down) reniform, 1.9-2.1 x 2.4-2.6 mm. Surface glabrous, with small whitish wartlets, dark-brown. 2n = 84.** Native to eastern Mediterranean and southwestern Asia, in moist places, sands, riverbanks; seldom hauling into the Carpathians.

**1909. *Althaea cannabina* L.** — Perennial, up to 150 cm high, hairs stiff, only stellate, stems erect, hirsute. **Mericarps (up) glabrous, with longitudinal ridges on dorsal side, 2.8-3 x 3.1-3.5 mm. Surface rugose. Seeds (down) reniform, flattish, 2-2.2 x 2.5-2.7 mm. Surface glabrous, chocolate-brown with small pale-brown verrucae. 2n = 28.** Native to the Mediterranean and western Asia, on marshy grounds, banks, forest and way borders, skeletal soils in warmer areas. Hu, Mo, Ro, Sk, Uk.

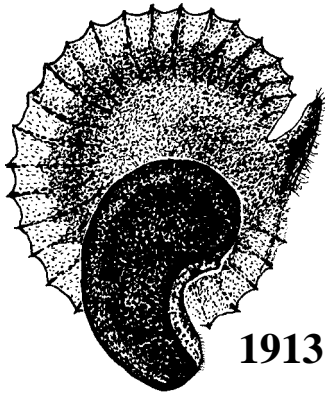
**1910. *Althaea hirsuta* L.** — Annual, up to 80 cm high, bristly hirsute, hairs stiff, simple and mixed with stellate hairs. **Mericarps elliptic to reniform, flattish, dorsal side with longitudinal ridge, lateral side wrinkly, 1.8-2.2 x 2.3-2.7 mm. 2n = 50, 56.** Native to southern Europe and northern Africa, in ditches, dry places, often as a weed of cultivated grounds. Hu, Mo, Ro, Uk.

**1911. *Althaea narbonensis* Pourr., *A. cannabina* subsp. *narbonensis* (Pourr.) Backer** — Perennial, stems erect, tomentose, hairs 1-2 mm long, flower in terminal inflorescence. **Mericarps (up) reniform or oval, lateral compressed, 2.2-3.1 x 2.8-3.2 mm. Surface short-hairy, dull, brown. Seeds (down) reniform, lateral flattish, 1.8-2.2 x 2.1-2.5 mm. Surface smooth, lustreless, brownish-grey.** Native to Europe, on meadows, along wood margins, riverbanks and shrubberies. Mo, Ro, Uk.

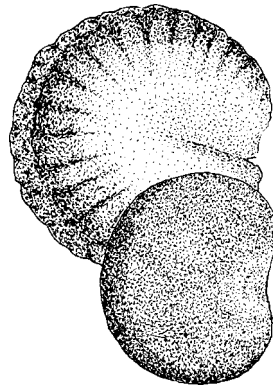
**1912. *Althaea officinalis* L.** — Perennial, 60-200 cm high, dense grey-downy, all hairs only stellate, stems erect, simple or poorly ramified. **Mericarps more or less densely covered with stellate hairs, 3-3.4 x 3-3.4 mm. Surface smooth, slight wrinkly, lateral side glabrous. Seeds (behind) reniform, flattish, 1.7-2 x 2.3-2.5 mm. Surface glabrous, fine reticulate, dark-brown. 2n = 42.** Native to Eurasia, in ditches, marshes, at field edges, riverbanks, in damp places; cultivated as a medicinal plant throughout the Carpathians.

**1913. *Althaea pallida* Willd., *A. biennis* (Winterl) Borbás, *Alcea biennis* Winterl** — Biennial up to perennial, 50-150 cm high, stellate bunchlets mixing with long simple hairs. **Mericarps (behind) globose-ovoid, dorsal side with deep, broad furrow, crenated, 5-6 x 4.5-5.3 mm. Surface in young stage hirsute, bare later on. Seeds reniform, 2.8-3.2 x 4.2-4.6 mm. Surface glabrous. 2n = 42.** Native to Eurasia, on sunny shrubby slopes, in vineyards, pastures. Hu, Mo, Ro, Sk, Uk.

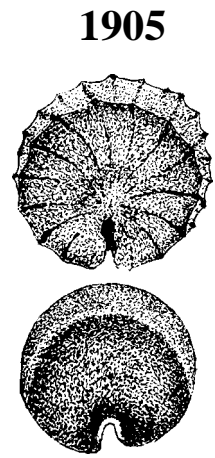




1913



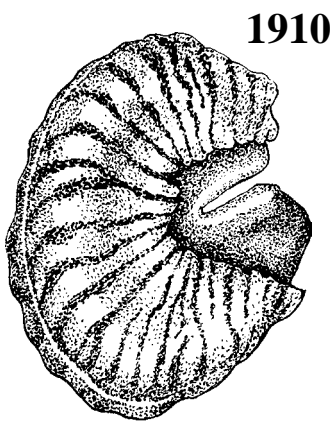
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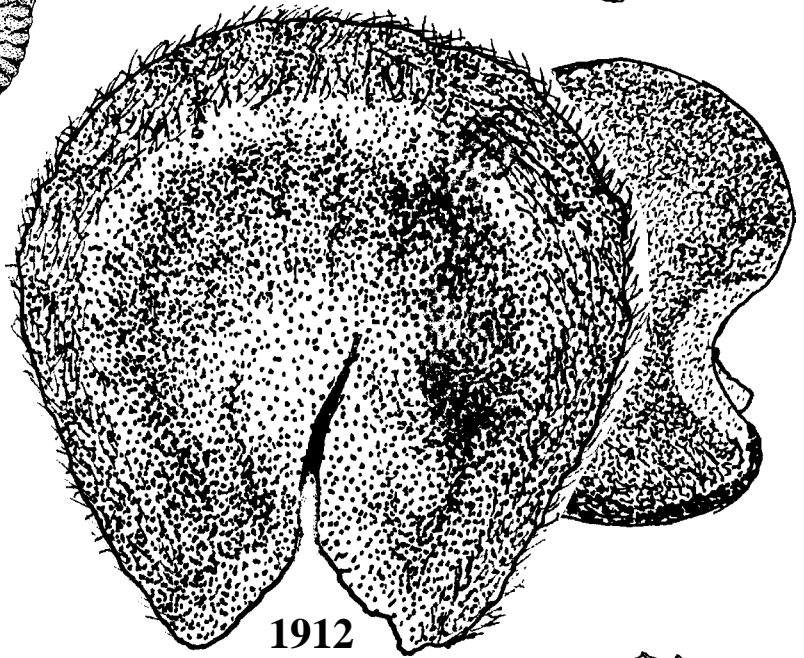
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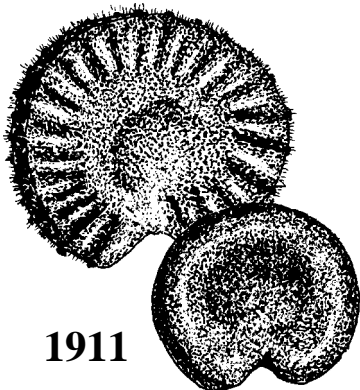
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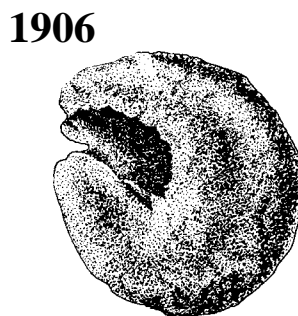
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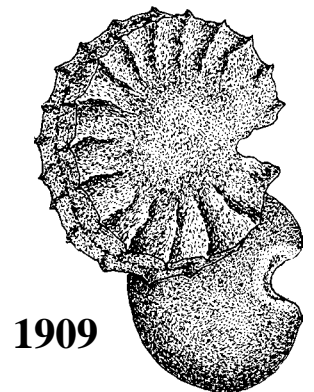
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1911



1906



1909

**1914. *Althaea rosea* (L.) Cav, *Alcea rosea* L.** — Annual up to perennial, stems erect, tomentose-pubescent in young stage, smooth later on. **Mericarps (behind) globose, flattish, seeds completely enclosed, 5.2-6.2 x 4.8-5.4 mm. Surface smooth to transversal ribbed, glabrous or sparse hairy. Seeds irregular reniform, 3.3-3.7 x 2.7-3 mm. Surface glabrous, greyish-brown. 2n = 26, 42, 56.** Place of origin unknown, perhaps *A. biennis* x *setosa* (Boiss) Alef. Native to eastern Europe and western Asia, for a long time cultivated as an ornamental and medicinal plant, widely naturalized. Hu, Mo, Ro, Sk, Uk.

**1915. *Althaea rugosa* (Alef.) Litvinov, *Alcea rugosa* Alef.** — Perennial, stems 60-200 cm high. **Mericarps (up) reniform, flattish, dorsal side furrowed, angles produced into divergent wings, hirsute, 4.7-5.3 x 4.5-5.2 mm. Surface lateral faces ribbed, setose. Seeds (down) reniform, near smooth, 3.3-3.7 x 2.3-2.7 mm. Surface greyish-brown. 2n = 42.** Native to southeastern Europe, in dry meadows, light coniferous forests, shrubberies; in the Carpathians scarcely cultivated as an ornamental plant in various cvs. Mo, Uk.

**1916. *Althaea taurinensis* DC., *A. multiflora* Rchb.** — Perennial, stems 70-150 cm high, similar to those of *A. officinalis*. **Mericarps (up) subglobose, flattish, 2.8-3.2 x 2.9-3.3 mm. Surface dorsal side hairy, ventral side glabrous, ribbed. Seeds (down) reniform, flattish, 2-2.2 x 2.4-2.6 mm. Surface smooth, on dorsal side with dispersed, small whitish verrucae, brown.** Native to the Mediterranean; mostly dragging into the Carpathians.

**1917. *Hibiscus cannabinus* L.** — Annual, up to 3 m high, stems shortly prickly. **Seeds crescent-shaped or reniform, lateral compressed, 3-3.6 x 3.2-3.4 mm. Surface scarce verrucose, shallow longitudinal furrowed, greyish-brown.** Native to and commonly cultivated as a fibre plant in India and tropical Africa; in the Carpathians experimentally cultivated in fields in southern steppe areas. Mo, Uk.

**1918. *Hibiscus esculentus* L., *Abelmoschus esculentus* (L.) Moench** — Annual, stems up to 1 m high, scarcely setaceous, sometimes woody. **Seeds ± spherical with distinct and large hilum, 3.9-4.5 x 3.3-3.7 mm. Surface longitudinal furrowed, short and dense hirsute, dull, dark-grey.** Native to Africa, worldwide commonly cultivated in the tropic areas as a mucilaginous vegetable (horn-like pods); in the

Carpathians only in the southern part of the Danube and the Black Sea, steppe banks. Mo, Ro, Uk.

**1919. *Hibiscus rosa-chinensis* L.** — Shrub or tree, up to 3 m high, much branched, with large leaves. **Seeds reniform or ± ellipsoid, 4.8-5.2 x 5.8-6.2 mm. Surface dense setaceous, only hilum without bristles, dull, rusty-brown.** Native to southeastern Asia; in the Carpathians grown as a domiciliary shrub, in free-nature it grows only along the Black Sea coast.

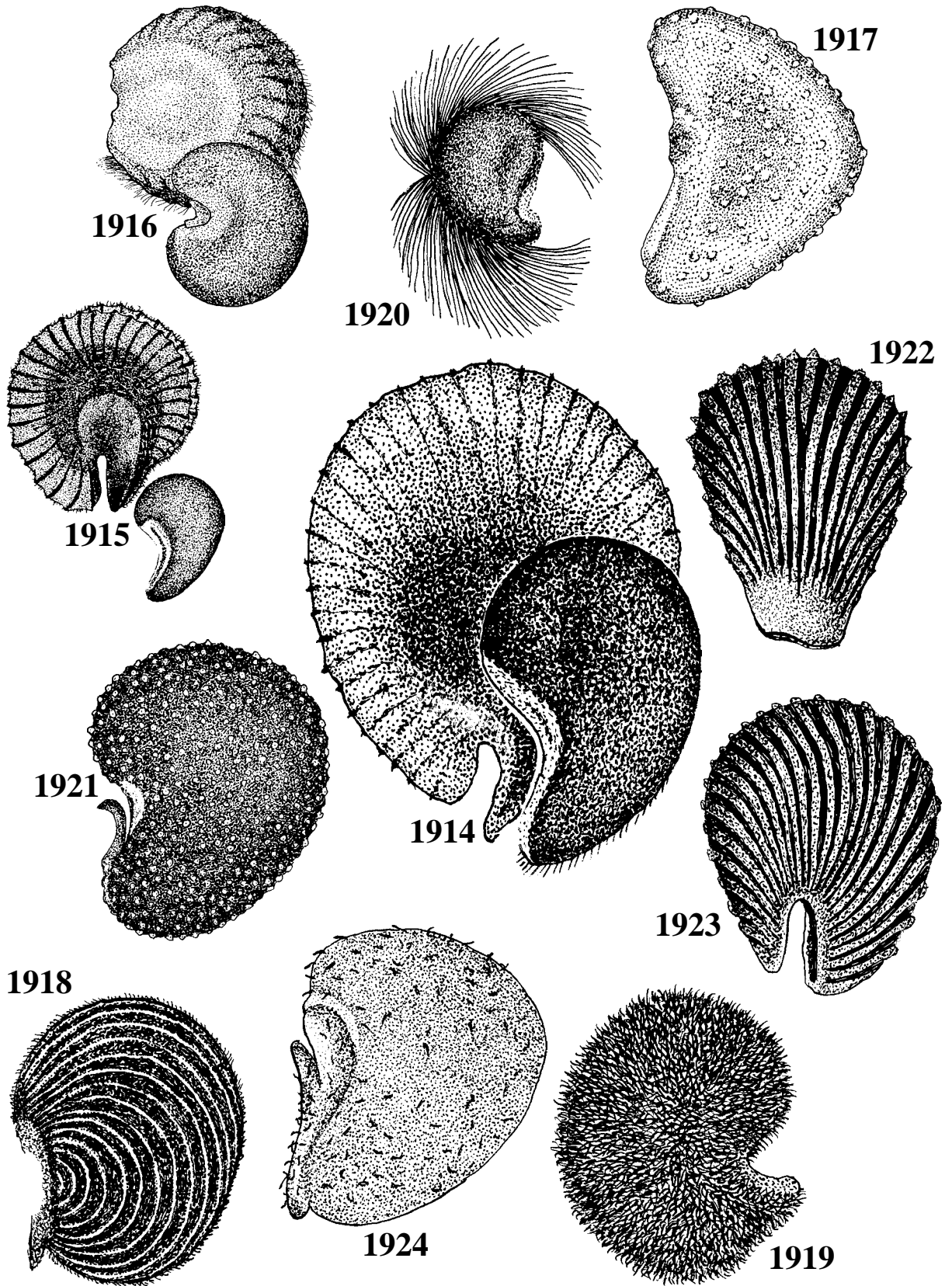
**1920. *Hibiscus syriacus* L.** — Shrub, up to 3 m high or tree up to 6 m high, twigs greyish. **Seeds reniform or elliptic, slight flattish, 3-3.3 x 3.8-4.3 mm. Surface smooth, lateral side bare, dorsal side dense covered with long hairs, dark-brown. 2n = 80-84.** Originally spread from China and India; in the Carpathians commonly cultivated as an ornamental and hedges in gardens and parks in many cvs, locally naturalized.

**1921. *Hibiscus trionum* L., *H. ternatus* Cav., *H. vesicarius* Cav.** — Annual, hirsute with stellate hairs, stems ascendent or erect, 10-80 cm high, branched. **Seeds reniform, slight flattish, 2-2.4 x 1.8-2 mm. Surface glabrous, moderate tuberculate, fine reticulate, greyish-black. 2n = 28, 56.** Native to the Mediterranean or western Asia; in the Carpathians it grows in cultivated grounds and waste places, at altitudes up to 1000 m. Hu, Mo, Pl, Ro, Sk, Uk.

**1922. *Malope malacoides* L.** — Annual, stems up to 50 cm high, simple or branched, dense hirsute. **Mericarps shell-shaped, slight flattish, 2.6-3 x 2-2.3 mm. Surface complete furrowed, glabrous, brown.** Native to southern Europe, northwestern Africa, in rocky slopes, cliffs, fields; in the Carpathians as an ornamental and medicinal plant.

**1923. *Malope trifida* Cav.** — Annual, up to 100-150 cm high, stems simple, erect, rough. **Mericarps irregular-reniform, flattish, 2.4-2.6 x 2.1-2.3 mm. Surface complete furrowed, glabrous, dull, pale- to dark-brown. 2n = 44, 50.** Originally growing in the south of northwestern Africa; in the Carpathians cultivated for ornament in gardens and parks, casually naturalized. Hu, Mo, Ro, Sk, Uk.

**1924. *Abutilon theophrasti* Medik., *A. avicennae* P. Gaertn., *Sida tiliifolia* Fischer** — Annual, up to 100-180 cm high, young stems tomentose, pubescent later on, erect, branched. **Seeds reniform, slight flattish, 2.9-3.5 x 2.6-3 mm. Surface sparse hairy, fine reticulate-areolate, greyish-black. 2n = 42.**



Originally growing in the eastern Mediterranean; in the Carpathians rarely cultivated in gardens and parks, medical plant. Hu, Mo, Ro, Sk, Uk.

**1925. *Sida hermaphrodita* (L.) Rusby., *S. napaea* (L.) Cav., *Napaea dioica* L.** — Perennial, up to 2-3 m high, flowers minute, some or many in a fan or bunch. **Seeds triangular, apex gradually narrowed, rounded or convex, ventral side truncate, with oblong hilum, lateral sides deflexed, 2.5-2.7 x 2.3-2.5 mm. Surface dense and shallow falsifoveolate, lustreless, greyish or brownish-grey.** Native to North America; in the Carpathians rarely cultivated in warmer areas, for fodder and as the fibre plant, or is hauling with agricultural crops. Mo, Uk.

**1926. *Sida rhombifolia* L.** — Perennial low shrubs, villous with white, simple and yellowish, stellate hairs, stems 20-45 cm high, procumbent, woody at the base, flowers solitary in leaf-axils. **Fruit segments mericarps, semirounded, dorsal side convex, depressed in the middle, ventral side with ridge, rooflike, veinous, with 2 tall straight pines, 2.8-3.2 x 1.9-2.2 mm. Surface dull, dark-grey. 2n = 14, 28.** Native to southeastern Asia, Africa, America; in the Carpathians cultivated as a medicinal plant, and rarely naturalized along roadsides and on waste grounds.

**1927. *Sida spinosa* L.** — Perennial or semi-shrub, up to 70 cm high, ramified. **Fruit segments mericarps, three-sided, with two sharp tips, 3.7-4.1 x 2.6-3 mm. Surface two sides blackish and one green. Seeds reniform or ovoid, three-sided, 1.9-2.2 x 1.6-1.8 mm. Surface smooth, dull, brown or blackish. 2n = 28.** Originally growing in North America; rarely hauling with agricultural produce into the Carpathians.

**1928. *Kitaibelia vitifolia* Willd.** — Perennial, up to 3 m high, stems sparingly branched, whole plant hispid with white hairs. **Seeds reniform, slight flattish, 2.4-2.6 x 2-2.2 mm. Surface smooth, dull, rusty-brown. 2n = 42, 44.** Native to southeastern Europe and Asia Minor, growing in damp thickets, grasslands and fields as a weed. Hu, Ro, Uk.

**1929. *Gossypium herbaceum* L.** — Annual, up to 1-1.5 m high, glabrous or sparsely hairy. **Seeds ellipsoid, dorsal side convex, ventral slight flattish with a longitudinal furrow, 10-12 x 4.6-5.5 mm. Surface dense covered with long white fibres, foveolate,**

**dull, greyish-brown.** Native probably to western Pakistan; rarely cultivated in southern Europe, especially in the Mediterranean region, a textile plant. Ro, Uk.

**1930. *Gossypium hirsutum* L.** — Annual or shrub, twigs slight compressed or angular, 90-120 cm high, branched. **Seeds elliptic, 8.3-9 x 5-5.5 mm. Surface dense covered with long white fibres; without fibres longitudinal furrowed in the upper part, smooth faint foveolate in the bottom part, dull, dark-brown.** Native to Central America, to a small extent cultivated in the warmest areas of the southeastern Carpathians, a textile plant. Hu, Mo, Ro, Uk.

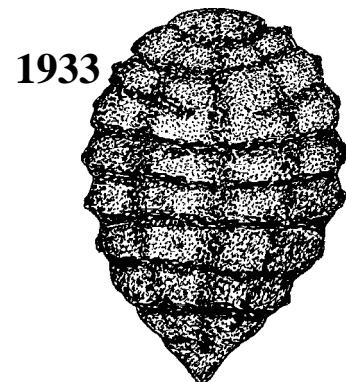
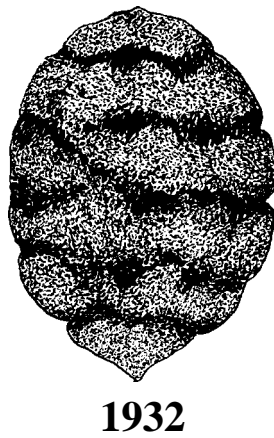
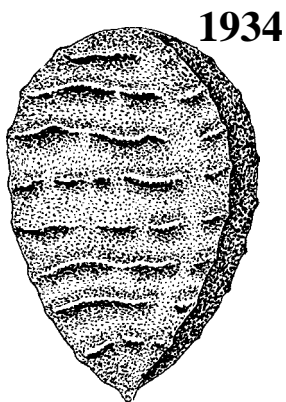
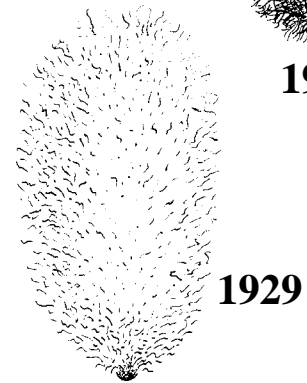
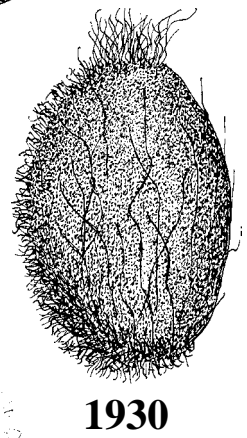
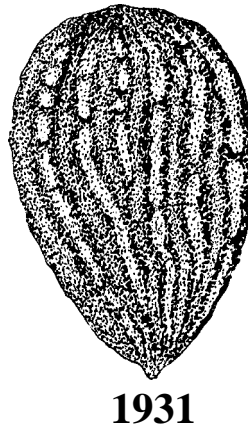
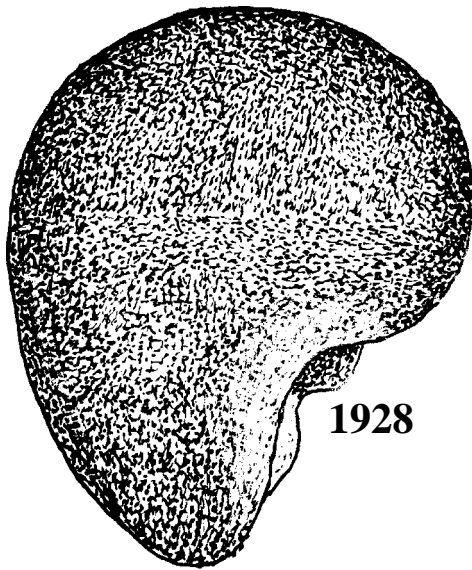
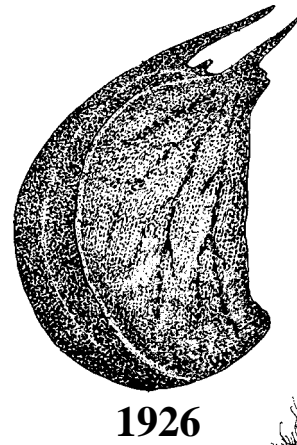
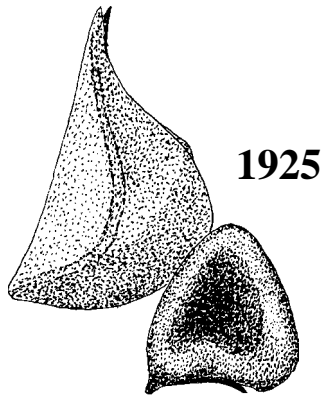
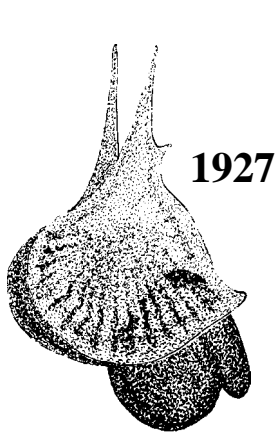
## 75. OXALIDACEAE

**1931. *Oxalis acetosella* L.** — Perennial, up to 15 cm high, stems creeping, sparsely pubescent. **Seeds ellipsoid to obovoid, strong flattish, apex obtuse, base acute, hilum at the acute end inconspicuous, 2.3-2.7 x 1.5-1.8 mm. Surface without fibres, longitudinal ribbed, red-brown. 2n = 22.** Native to Eurasia, common on hedgebanks, shady woodlands rich in humous; throughout the Carpathians.

**1932. *Oxalis valdiviensis* Barn.** — Perennial, glabrous, caespitose, with dichasia of purpur-veined, yellow flowers. **Seeds elliptic, apex roundish, bottom acuminate, 1.3-1.5 x 0.9-1.1 mm. Surface deep, irregular furrowed, dull, dark-grey.** Originally spread from Chile, mostly cultivated in flowerpots, for ornament, occasionally naturalized.

**1933. *Xanthoxalis corniculata* (L.) Small, *Oxalis corniculata* L., *O. repens* Thunb.** — Annual up to perennial, stems 30-50 cm high, procumbent or ascending, ramified from the base, rooting at the nodules. **Seeds elliptic to obovoid, strong flattish, apex obtuse, base acute, hilum at acute end inconspicuous, 1.3-1.5 x 0.8-0.9 mm. Surface transversal ridged, lustreless, reddish-brown. 2n = 24.** Originally growing in the Mediterranean; in the Carpathians mostly hauling into dry, sandy and stony soils of warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**1934. *Xanthoxalis dillenii* (Jacq.) Holub, *X. stricta* (L.) Small., *Oxalis navieri* Jord.** — Annual or biennial, stems 5-20 cm high, procumbent, ascending, dense hirsute, flowers pale-yellow. **Seeds obovoid, apex rounded, bottom acuminate, with small hilum, 1.2-1.4 x 0.8-1 mm. Surface transversal breakly ribbed, faint lustrous, pale- or dark-brown. 2n = 12.** Native to North America; rarely hauling into



the Carpathians, naturalized as a weed of cultivated grounds.

**1935. *Xanthoxalis fontana*** (Bunge) Holub, *Oxalis fontana* Bunge, *O. europaea* Jordan — Perennial, stems up to 20-40 cm high, erect, ramified, hairs on stems and leaf stalks curly. **Seeds ellipsoid to obovoid, strong flattish, apex obtuse, base acute, hilum at acute end inconspicuous, 1.3-1.5 x 0.8-0.9 mm. Surface transversal ribbed, lustreless, reddish-brown. 2n = 24.** Native to North America; introduced as an ornamental, cultivated in the gardens, cemeteries, often naturalized as a weed of cultivated grounds. Hu, Pl, Ro, Sk, Uk.

## 76. LINACEAE

**1936. *Linum austriacum*** L., *L. angustifolium* auct. non. Huds., *L. perenne* var. *austriacum* (L.) Schiede — Perennial, smooth, stems tufted, from base ascendent or erect, 10-60 cm high, ramified above, richly leafy. **Seeds obovoid to ellipsoid, strong flattish, 3.4-3.8 x 2-2.2 mm. Surface fine reticulate, lustrous, nut- to blackish-brown, margin yellowish or pale-brown. 2n = 18.** Native to central and southern Europe, on sunny, dry slopes, rocks and screes, in lowlands and uplands; in all Carpathian territories.

**1937. *Linum bienne*** Mill., *L. angustifolium* Hudson — Biennial or perennial (rarely annual), stems glabrous, 20-60 cm high, usually branched, slender ascending or erect. **Seeds obovoid, lateral strong compressed, 2.3-2.5 x 1.5-1.6 mm. Surface glabrous, lustrous, pale- to dark-brown. 2n = 30.** Native to western and southern Europe, in fallows and at field margins. Hu, Ro, Uk.

**1938. *Linum catharticum*** L. — Annual, very slender, glabrous, rarely more than 15 cm high, dichasially branched from base, erect or ascending. **Seeds obovoid or crescent-shaped, lateral strong compressed, 1.2-1.4 x 0.7-0.8 mm. Surface glabrous, faint lustrous, pale-brown. 2n = 16.** Native to Europe, mainly to mountains, pastures, dry meadows, light woods, overgrown screes, silts, moors; throughout the Carpathians.

**1939. *Linum dolomiticum*** Borbás — Annual, 15-20 cm high, flowers yellow, sepals 6-7 mm, petals 10-16 mm. **Seeds obovoid or crescent-shaped, lateral strong flattish, 2.6-2.8 x 1.4-1.6 mm. Surface faint lustrous, glabrous, pale-brown. 2n = 28.** Restricted to dolomite rocks in Hungary.

**1940. *Linum extraaxillare*** Kit., *L. perenne* var. *carpathicum* Uechtr., *L. alpinum* auct. non Jacq. — Perennial, stems 20-40 cm high, scarcely leafy. **Seeds obovoid to ellipsoid, strong flattish, 4.2-4.6 x 2.4-2.6 mm. Surface fine reticulate, lustreless, brown with pale margin. 2n = 18.** Endemic to the Carpathians and the Balkan Peninsula, in mountain meadows of subalpine and alpine zones. Pl, Ro, Sk, Uk.

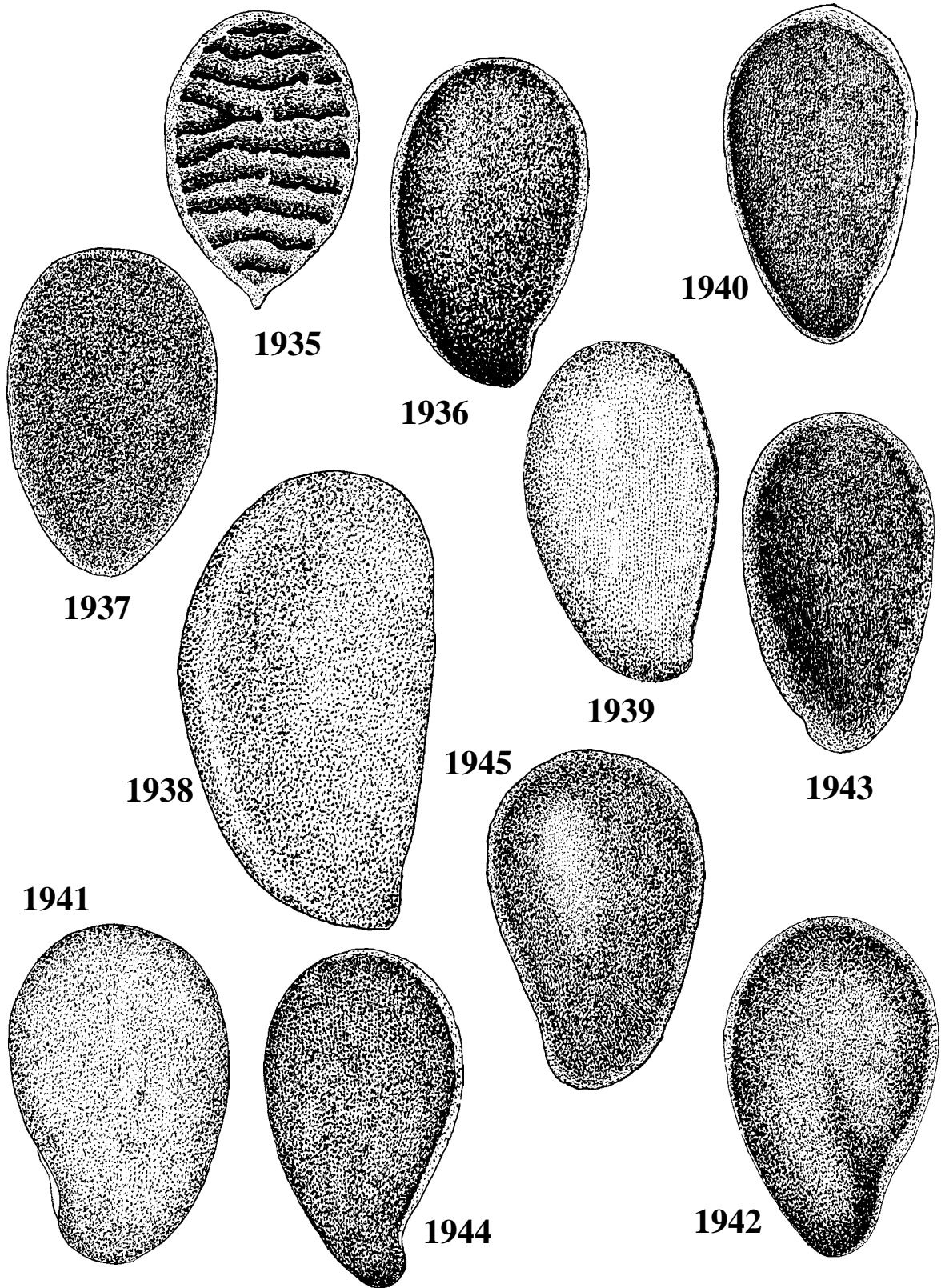
**1941. *Linum flavum*** L. — Perennial, stems robust, erect, 20-60 cm, sharply up to wingly, angular. **Seeds obovoid, strong flattish, 2.4-2.8 x 1.5-1.7 mm. Surface smooth, lustreless, fine wrinkly, pale-brown. 2n = 30.** Native to central and southeastern Europe, in light, dry, calcareous stands, borders of xerotherme shrubberies and wooded slopes, in lowlands and uplands; rarely cultivated throughout the Carpathians in gardens as an ornamental.

**1942. *Linum grandiflorum*** Desf. — Annual, caespitose, stems erect, up to 30-60 cm high, glabrous, leaves broad lanceolate. **Seeds obovoid or faint reniform, lateral strong compressed, 3.8-4.2 x 2.4-2.6 mm. Surface glabrous, lustrous, dark-brown, with pale border.** Native to Algeria; in the Carpathians rarely cultivated as an ornamental in parks and gardens.

**1943. *Linum hirsutum*** L., *L. pannonicum* A. Kern. — Perennial, shortly and densely pubescent, stems robust, erect, 20-60 cm high, dense leafy. **Seeds obovoid to ellipsoid, strong flattish, 2.3-2.7 x 1.3-1.5 mm. Surface fine reticulate-areolate, lustrous, dark-brown, with pale margin. 2n = 16.** Native to central and eastern Europe, on sunny and sandy steppes, vineyards, stony slopes, shrubberies; throughout the Carpathians.

**1944. *Linum hologynum*** Rchb. — Biennial, stems up to 40 cm high, numerous, ascending, glabrous. **Seeds obovoid, strong flattish, base expressively curved, 3.3-3.6 x 1.9-2.1 mm. Surface fine reticulate-areolate, blackish-brown to black, mostly pale on ventral side.** Native to the Balkan Peninsula, on mountain pastures, herbageless slopes, river-silts. Ro.

**1945. *Linum narbonense*** L. — Perennial, stems 20-60 cm high, erect or ascending, glabrous. **Seeds obovoid, strong flattish, base faint curved, clearly bordered, 4.7-5.2 x 2.9-3.2 mm. Surface glossy, fine reticulate-areolate brown. 2n = 30.** Native to the Mediterranean and northern Africa, in dry stony soils,





rocky steppes; its occurrence in the Carpathian flora is dubious, rarely cultivated in gardens as an ornamental.

**1946. *Linum perenne* L.** — Perennial, smooth, stems tufted, ascendent or erect, 10-60 cm high, rounded, inflorescence ramified. **Seeds obovate to ellipsoid, strong flattish, 4-5 x 2-2.5 mm. Surface fine wrinkly or tuberculate, lustrous, brown to blackish-brown, with a narrow-lighter edge on ventral side. 2n = 18.** Native to central and eastern Europe, in dry, sunny, calcareous stands, rocky slopes and mountain meadows of subalpine and alpine zones; throughout the Carpathians.

**1947. *Linum tauricum* Willd., *L. serbicum* Podp.** — Perennial, stock erect, much branched, often woody, flowering stems up to 40 cm. **Seeds ovoid, strong flattish, base faint curved, 2.5-2.8 x 1.4-1.6 mm. Surface fine reticulate-areolate, lustreless, brown.** Native to the northern part of the Balkan Peninsula, in stony and grassy coastal lands. Mo, Ro, Uk.

**1948. *Linum tenuifolium* L.** — Perennial, bare, stems tufted, ascendent up to erect, 20-45 cm high, often with barren shoots. **Seeds obovoid to ellipsoid, strong flattish, 2.1-2.3 x 1.2-1.3 mm. Surface fine reticulate-areolate, glossy, brown with paler margin. 2n = 18.** Native to the mountains of central and southern Europe, mostly in the subalpine zone, in dry, stony, calcareous, sunny stands, grassy, stony and forest steppes. Hu, Mo, Ro, Sk, Uk.

**1949. *Linum trigynum* L., *L. aureum* Waldst. et Kit., *L. gallicum* L.** — Annual, glabrous, stems erect, 10-30 cm high, branched above. **Seeds obovoid to ellipsoid, strong flattish, 1.1-1.3 x 0.7-0.8 mm. Surface fine reticulate-areolate, glossy, brown. 2n = 20.** Native of Eurasia, on scrubs, in open grassy places, stony steppes of warmer areas. Hu, Ro, Sk, Uk.

**1950. *Linum usitatissimum* L., *L. humile* Miller** — Annual, bare, stems unramified, erect, rounded, dense leafy, ramified above. **Seeds obovoid to ellipsoid, strong flattish, 4-4.5 x 2.2-2.6 mm. Surface fine reticulate-areolate, high lustrous, brown. 2n = 30, 32.** Origin unknown (perhaps Asia), one of the oldest cultivated plants as a field crop, for fibres, edible and technical oil production; throughout the Carpathians.

**1951. *Radiola linoides* Roth, *Linum radiola* L., *Radiola multiflora* (Lam.) Asch.** — Annual, minute, glabrous, stems erect, slender, ramified from base, 1-10 cm high. **Seeds obovoid to ellipsoid, slight**

**flattish, often on one side-face flat and the other slight convex, bases mostly straight, 0.4-0.5 x 0.2-0.3 mm. Surface smooth, lustrous, areolate, brown. 2n = 18.** Native to Eurasia, on stripped grounds of ponds, moist sandbanks, wet roads, peatbog edges; throughout the Carpathians.

## 77. GERANIACEAE

**1952. *Geranium asphodeloides* Burn. fil., *G. tauricum* Rupr.** — Perennial, stems up to 30-75 cm high, erect, with deflexed, sometimes glandular hairs. **Seeds subglobular or ovoid, transversal section round, base truncate, apex rounded, 1.9-2.1 x 1.6-1.7 mm. Surface reticulate, lustreless, pale- to dark-brown.** Native to southern Europe, Asia Minor, in shrubberies, orchards. Ro, Uk.

**1953. *Geranium bohemicum* L.** — Annual to biennial, stem 20-60 cm high, erect, hirsute, glandular, branched. **Seeds cylindric, apex and base obtuse, radicular lobe c. half of the cotyledonary one, cotyledons with deep lateral notch, chalaza area flat or slight convex, raphe c. half of the seed length, 3.4-3.8 x 1.8-2 mm. Surface reticulate, dull, raphe brown or dark-brown. 2n = 28.** Native to central and eastern Europe, on pastures, forest clearings, scrubs, burned areas; throughout the Carpathians.

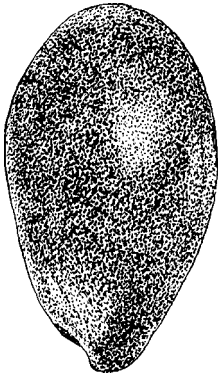
**1954. *Geranium cinereum* Cav.** — Perennial, stems 10-15 cm high, leaves with a long stalk, softly downy, flowers carmine-red. **Seeds ellipsoid, rounded in the transversal section, radicle hardly reaching on half of the cotyledons, with rib along radicle to hilum, 3.6-4 x 1.7-1.9 mm. Surface fine longitudinal waved, dull, greyish-brown.** Native to the Mediterranean region, on mountain stony slopes; in the Carpathians cultivated on rock-gardens as an ornamental.

**1955. *Geranium collinum* Stephan** — Perennial, stems up to 25-50 cm high, arcuate, ascending or procumbent, hirsute, twigs branched. **Fruits (left) 1-seeded, 3.5-4 x 1.9-2.3 mm. Seeds (right) ovoid, ± roundish in transversal section, with hilum and short longitudinal furrow on ventral side, 2.2-2.6 x 1.5-1.7 mm. Surface smooth, lustreless, dark-brown.** Native to southeastern Europe and eastern Asia; in moist and boggy meadows, faint saline shrubberies, moist steppe stands. Mo, Ro.

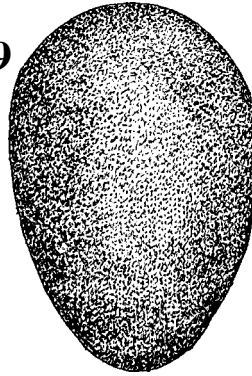
**1956. *Geranium columbinum* L.** — Annual, scattered, shortly hirsute, unglandular, stems ascendent or



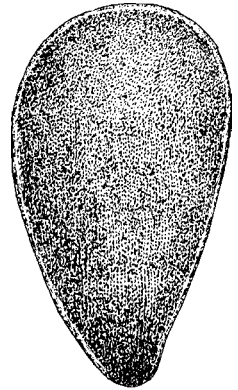
1950



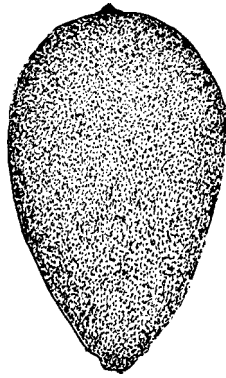
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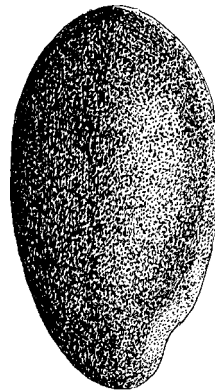
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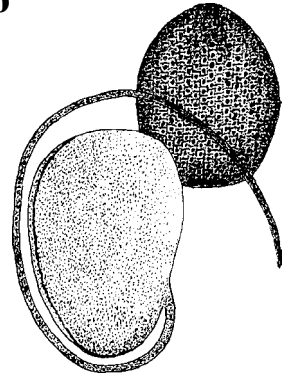
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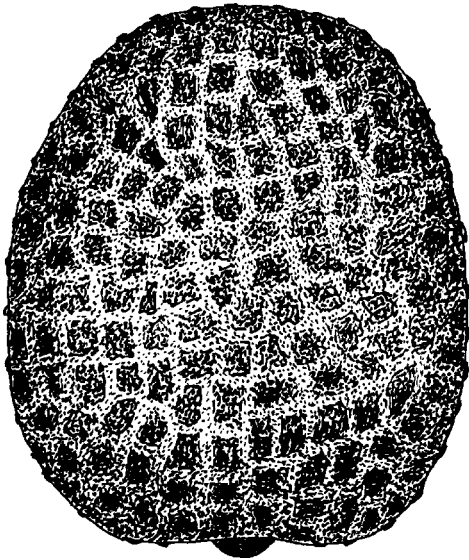
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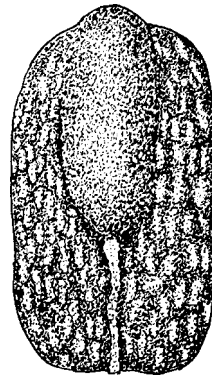
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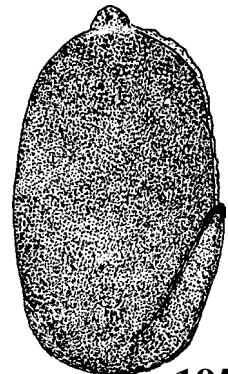
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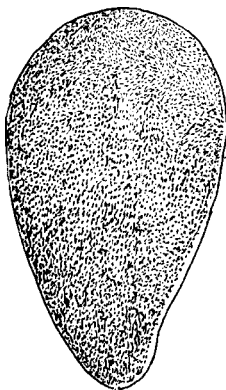
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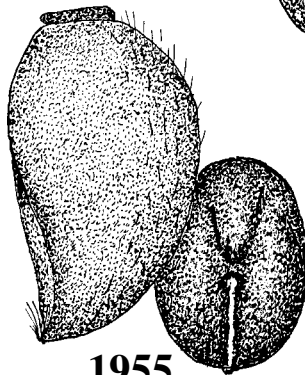
1954



1947



1955



erect, 20-60 cm high, poorly ramified. **Fruits (down) 1-seeded, broad ellipsoid, with long beak. Seeds (above) broad ellipsoid, apex rounded, base obtuse, chalaza area convex without rim, raphe 1/6 of the seed length, 2-2.5 x 1.7-1.9 mm. Surface reticulate, brown to dark-brown. 2n = 18.** Native to the Mediterranean; on sunny slopes, fallow fields, boundaries, pastures; in all Carpathian territories.

**1957. *Geranium dissectum* L.** — Annual, stems 10-60 cm high, hirsute and scattered glandular, branched, procumbent or ascendent. **Seeds broad ellipsoid, apex rounded, base obtuse, chalaza area convex, without rim, raphe 1/6 of the seed length, 1.8-2 x 1.3-1.5 mm. Surface pitted, reticulate-foveolate, grey to nut-brown. 2n = 22.** Native to Eurasia, except the extreme north, in fields and damp places, along roadside verges with stony, dry soils; throughout the Carpathians.

**1958. *Geranium divaricatum* Ehrh., *G. punctatum* Kit., *G. hispidum* Kit.** — Annual, stems 25-60 cm high, ascending or erect, sometimes procumbent, hirsute and glandular. **Fruits (left), ellipsoid, planoconvex, long raphe on dorsal side, beaked, 2.9-3.3 x 1.5-1.7 mm. Surface ventral side obliquely veinous, hairy on apex. Seeds (right) ellipsoid, bottom part with rounded hilum, with long nose above hilum, 2.1-2.5 x 1.4-1.6 mm. Surface smooth, lustreless, dark-brown. 2n = 26.** Native to Eurasia, on shrubby and stony slopes, forest clearings, in vineyards, waste places; in the whole Carpathians, sporadically.

**1959. *Geranium lucidum* L.** — Annual, brightly- to glossy-green, sometimes reddish, glabrous or scattered hirsute, stems 10-40 cm high, ascendent or erect. **Fruits (left), planoconvex, 2.1-2.5 x 1.1-1.3 mm. Surface ribbed, wrinkly. Seeds (right) elliptic, slight flattish, apex obtuse, base papillate, chalaza area convex to conical, raphe c. 1/4 of the seed length, 1.8-2.2 x 1-1.2 mm. Surface smooth, orange to orange-brown. 2n = 20.** Native to Eurasia, in upland light deciduous forests, on shady overgrown rocks, shrubberies; in all Carpathian territories.

**1960. *Geranium macrorrhizum* L.** — Perennial, stems 20-50 cm, softly glandular-pubescent, very aromatic. **Fruits (left) ellipsoid, flattish on dorsal side, with rib on ventral side form which terminated to lateral sides veins, 2.6-3 x 1.4-1.6 mm. Surface glabrous, dorsal side ridged. Seeds (right) ellipsoid to obovoid, slight flattish, apex obtuse, base slight papillate, chalaza area convex, raphe**

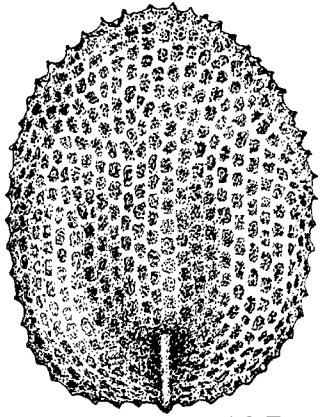
**1/4-1/3 of the seed length, 2-2.4 x 1.2-1.4 mm. Surface smooth to faint reticulate, reddish-brown. 2n = 46.** Native to Europe, in shady places in mountains, calcicole, cultivated for ornament. Mo, Ro, Uk.

**1961. *Geranium molle* L.** — Annual (perennial), dense pubescent, scattered glandular above, stems 10-40 cm high, procumbent or ascendent, branched from base. **Fruits (right) ellipsoid, with rib on ventral side form which terminated to lateral sides veins, 1.6-1.8 x 1.1-1.3 mm. Seeds (left) elliptic, apex and base obtuse, chalaza area flat or convex, raphe c. 1/4 of the seed length, 1.5-1.7 x 1-1.2 mm. Surface smooth to faint reticulate, orange brown. 2n = 26.** An Euro-Siberian element, in fields, gardens, vineyards, roadside verges, semidry turfs with porous and sandy soils; throughout the Carpathians.

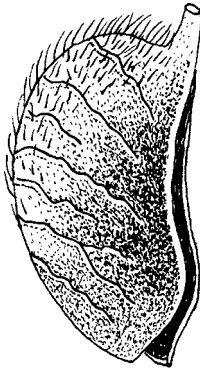
**1962. *Geranium palustre* L.** — Perennial, stems 20-60 cm high, erect or ascendent, ramified, hirsute, non-glandular. **Fruits (down) tear-shaped, flattish on one side, with long beak. Seeds ellipsoid, slight, flattish, apex and base obtuse, chalaza area flat or slight convex, raphe c. half of the seed length, 2.4-2.7 x 1.5-1.7 mm. Surface reticulate, dark-brown. 2n = 28.** Native to European lowlands to uplands, in moist places, swampy stands, willow scrubs; throughout the Carpathians.

**1963. *Geranium phaeum* L.** — Perennial, stems erect, 40-70 cm high, with short glandular and long glandular hairs. **Fruits (right) ellipsoid, flattish on one side, with transversal ribs on the apex, beaked, 4.6-5.2 x 1.7-1.9 mm. Surface base part thorny. Seeds (left) ellipsoid, slight flattish, apex obtuse, base papillate, radicular lobe 1/3-1/2 of the cotyledonary lobe, chalaza area strong conical, without rim, raphe 1/2-2/3 of the seed length, 2.8-3.2 x 1.4-1.6 mm. Surface smooth to faint reticulate, orange-brown. 2n = 28.** Native to Europe, in moist and mountain meadows, wet scrubby forests, lowland forests; in all Carpathian territories.

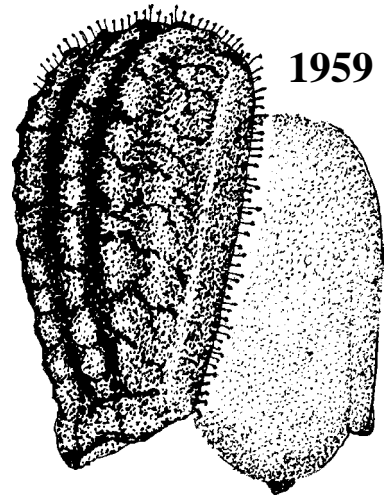
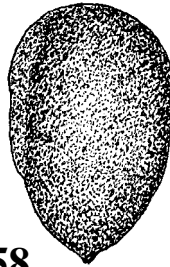
**1964. *Geranium pratense* L.** — Perennial, stems 30-80 cm, erect, with deflexed hairs below and glandular hairs above. **Seeds ellipsoid, slight flattish, base obtuse, radicular lobe 1/3-1/2 of the cotyledonary lobe, chalaza area flat to slight convex, raphe 1/2-2/3 of the seed length, 3.4-3.8 x 1.7-1.9 mm. Surface reticulate, grey to nut-brown. 2n = 28.** Native to Eurasia, on wet meadows, coastal shrubberies, riverbanks, boundaries; in all Carpathian territories.



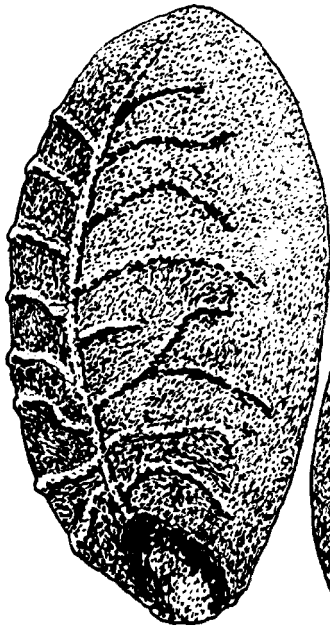
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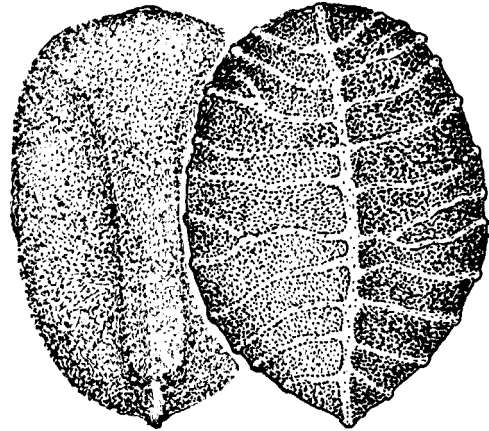
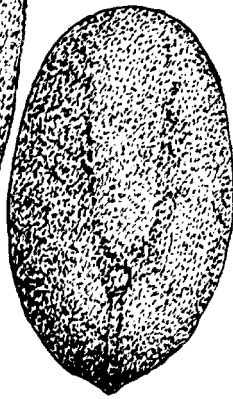
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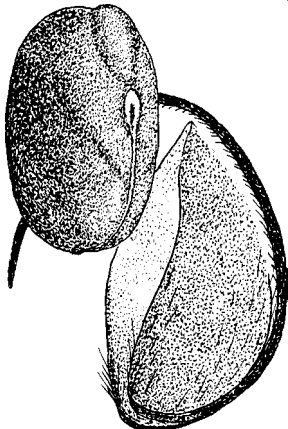
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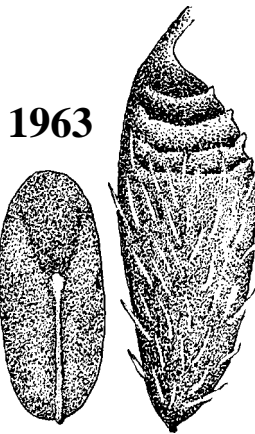
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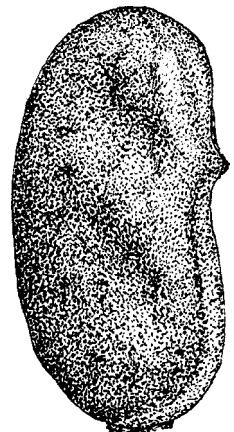
1961



1962



1963



1964

**1965. *Geranium purpureum*** Vill. — Annual or biennial, more or less hairy, stems 15-50 cm high, procumbent or ascending. **Fruits (left) ellipsoid convex ventral side, margin waved, ventral side with central rib and cross veins, 2.6-2.8 x 1.1-1.3 mm. Seeds (right) slight obovoid, transversal section roundish, apex and bottom rounded, 1.8-2 x 1-1.1 mm. Surface glabrous, slight lustrous, rose-brown.  $2n = 32$ .** Native to southern and western Europe, in open and stony-sandy places. Ro.

**1966. *Geranium pusillum*** Burm. fil. — Annual (perennial), whole plant hirsute, stems 10-30 cm high, branched, glandular above. **Fruits (right) ellipsoid, 1.7-1.9 x 0.9-1 mm. Seeds (left) ellipsoid, slight flattish, apex obtuse with short beak, base obtuse, chalaza area slight convex, raphe c. 1/4 of the seed length, 1.6-1.8 x 0.8-0.9 mm. Surface smooth to faint reticulate, dull, reddish-brown.  $2n = 26$ .** Native to the Mediterranean, on fields, pastures, ways, in waste places; throughout the Carpathians.

**1967. *Geranium pyrenaicum*** Burm. fil., *G. umbrosum* Waldst. et Kit. — Perennial, with short glandular and long eglandular hairs, stems ascendent or erect, 20-50 cm, branched. **Fruits (left), 2.5-2.9 x 1.1-1.3 mm. Seeds (right) ellipsoid, slight flattish, radicular lobe 3/4 of the cotyledonary one, chalaza area slight convex, raphe 1/4 of the seed length, 2-2.4 x 1-1.2 mm. Surface smooth to faint reticulate, rusty-brown.  $2n = 26, 28$ .** Native to western Europe, in abandoned vineyards, orchards, forest edges, shrubberies; in warmer areas of the whole Carpathian territories.

**1968. *Geranium robertianum*** L. — Annual to biennial, glandularly and scattered hirsute, often reddish, disagreeably stinking, stem erect or procumbent, 10-50 cm high, branched. **Fruits (left) ellipsoid, apex waved, bottom narrowed, 2.8-3.2 x 1.1-1.3 mm. Surface veinous. Seeds (right) ellipsoid, slight flattish, apex and base rounded, radicular lobe 3/4-5/6 of the cotyledonary lobe, chalaza area slight convex, raphe 1/6-1/4 of the seed length, 2-2.4 x 1-1.2 mm. Surface smooth to faint reticulate, reddish-brown.  $2n = 64$ .** Native to Eurasia, in shrubberies, forest margins, shady rocks, clearings, gardens; throughout the Carpathians.

**1969. *Geranium rotundifolium*** L. — Annual, stems tufted, procumbent up to erect, 10-40 cm high, with mixed, long and short, glandular and eglandular hairs. **Seeds broad ellipsoid, apex obtuse to truncate, base**

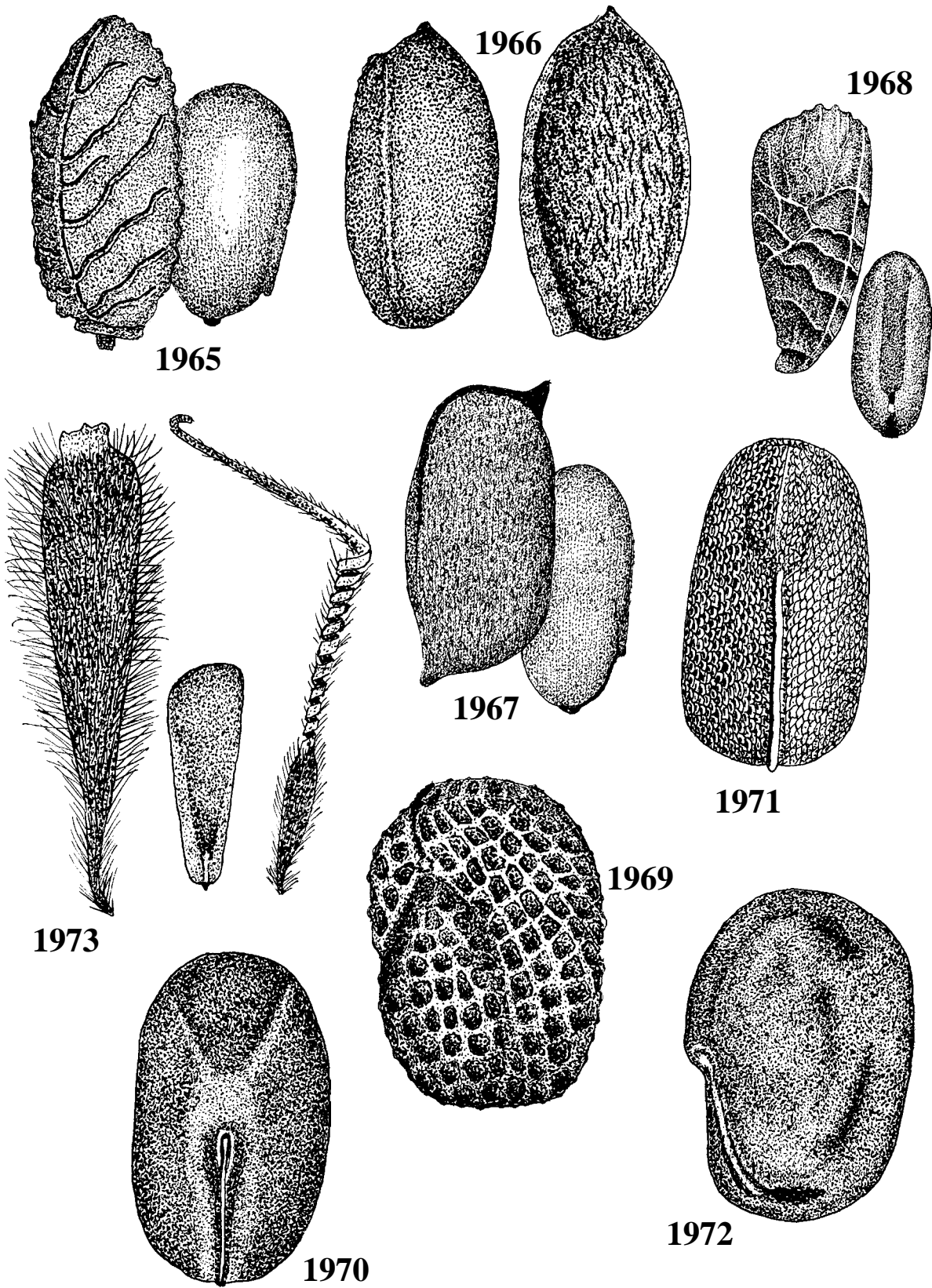
**obtuse, radicular lobe 3/4-5/6 of the cotyledonary lobe, chalaza area convex, raphe 1/6-1/4 of the seed length, 1.6-2 x 1.3-1.5 mm. Surface conspicuous reticulate, reddish-brown.  $2n = 26$ .** Native to Eurasia, in waste places, boundaries, vineyards, walls, banks. Hu, Mo, Ro, Sk, Uk.

**1970. *Geranium sanguineum*** L. — Perennial, stems ascendent or procumbent up to erect, ramified from base, 20-40 cm high, hirsute and glandular. **Seeds ellipsoid, apex and base obtuse, radicular lobe 1/3-1/2 of the cotyledonary length, chalaza area flat to convex, raphe 1/2-2/3 of the seed length, 3.2-3.8 x 2-2.5 mm. Surface faint reticulate, dark-brown.  $2n = 84$  (52-56).** Native to Eurasia, on light forest borders, shrubberies, overgrown rocks and screes; throughout the Carpathians.

**1971. *Geranium sibiricum*** L. — Perennial, stems 30-60 cm high, procumbent or ascendent, branched from base, on stems and leafstalks hairy. **Seeds ellipsoid, slight flattish, base slight papillate, radicular lobe half of the cotyledonary length, chalaza area convex, raphe half of the seed length, 2.3-2.7 x 1.2-1.4 mm. Surface reticulate, dark-brown.  $2n = 28$ .** Native to Eurasia, along roadsides, embankments, riverbanks, coastal shrubberies. Br, Hu, Pl, Ro, Sk, Uk.

**1972. *Geranium sylvaticum*** L. — Perennial, stems 20-60 cm high, erect, hirsute. **Seeds ellipsoid to ovoid, radicular lobe 1/3-1/2 of the cotyledonary one, chalaza area flat to convex, raphe 1/2-2/3 of the seed length, 3.4-3.8 x 1.9-2.1 mm. Surface reticulate, dark-brown.  $2n = 28$ .** Native to Eurasia, in mountain and damp meadows, woodlands, rocky slopes, at altitudes 1600-2000 m; throughout the Carpathians.

**1973. *Erodium ciconium*** (L.) L'Hér., *Geranium ciconium* (L.) L'Hér. — Annual to biennial, stems 10-70 cm high, ascendent or erect, shortly and glandularly hirsute. **Fruits with spiral beaklike style column (hook), 9-11 x 1.8-2.2 mm. Surface with whitish hairs. Seeds prolonged obovate to elliptic, base papillate, radicular lobe c. 5/6 of the cotyledonary lobe length, chalaza area rounded, raphe c. 1/6 of the seed length, 4.2-4.6 x 1.3-1.5 mm. Surface smooth to faint reticulate, reddish-brown.  $2n = 18$  (20).** Native to Mediterranean, in fields, pastures, steppes up to 1500 m altitude. Hu, Mo, Ro, Sk, Uk.



**1974. *Erodium cicutarium* (L.) L'Hér., *Geranium cicutarium* L.** – Annual to biennial, disagreeably stinking, stems procumbent or erect, up to 100 cm high, hirsute. **Fruits with spiral hook, 5.8-6.3 x 1-1.2 mm. Surface with whitish hairs. Seeds prolonged obovate, base papillate, radicular lobe 3/4-5/6 of the cotyledonary lobe length, chalaza area conical, raphe 1/6-1/4 of the seed length, 2.5-3 x 0.9-1.1 mm. Surface smooth to faint reticulate, brown.  $2n = 40$ .** Native to Eurasia, in dry sandy or disturbed grounds, steppes, fields, pastures, meadows; throughout the Carpathians.

**1975. *Erodium malacoides* (L.) L'Hér.** – Annual to biennial, stems single, erect, 20-60 cm high, disagreeably stinked, branched, softy hirsute, flowers violet. **Fruits with spiral hook, conical, bottom gradually narrowed, apex with turbinate prickles, 4-5 x 0.8-1.1 mm. Surface all hirsute. Seeds oblong obovoid, 2.6-2.9 x 0.8-0.9 mm.  $2n = 40$ .** Native to southern Europe, rarely hauling into the Carpathians, as weed on dryer stands, shrubberies. Sk, Uk.

**1976. *Erodium moschatum* (L.) L'Hér.** – Annual up to biennial, smelling of musk, stems 10-50 cm high, hispid with usually deflexed hairs, dense above, sparse below. **Fruits with spiral hook, 5.5-6 x 1.2-1.4 mm. Surface all hairy. Seeds prolonged obovoid, slight flattish, with hilum and short furrow on ventral side, 3-3.4 x 1-1.1 mm. Surface glabrous, faint lustrous, rose-brown.  $2n = 20$ .** Native to southern and western Europe, in cultivated grounds and waste places; rarely hauling into the Carpathians, naturalized in warmer areas. Hu, Ro, Sk.

**1977. *Erodium neilreichii* Janka, *E. hoefftianum* C. A. Mey** – Annual to biennial, stems single, erect, 20-40 cm high, softly hirsute up to glabrous. **Fruits with spiral hook, 6.5-7 x 1.2-1.3 mm. Surface all hirsute. Seeds prolonged obovoid, base papillate, radicular lobe c. 3/4-4/5 of the cotyledonary one, chalaza area conical, raphe 1/5-1/4 of the seed length, 2.7-3.2 x 0.9-1.1 mm. Surface smooth to faint reticulate, dark-brown.** Native to Europe (Balkan and Pannonia), on sandbanks and minute screes. Hu, Ro, Sk.

**1978. *Pelargonium grandiflorum* Willd.** – Perennial, shrub, stems 20-50 cm high, 2-3 cm rough, faint woody, scarcely hirsute at the bottom, above, much branched. **Fruits with spiral hook, 6-7 x 1-1.2 mm. Surface all hairy. Seeds ellipsoid, dorsal side convex, ventral flattish with distinct furrow in**

**lower half, roughened growth in upper part, 4-5 x 1.2-1.5 mm. Surface glabrous, dull, rose-brown.** Native to southern Africa, introduced into Europe in 1794, now often cultivated as an ornamental on balconies and garden-beds; in all Carpathian territories.

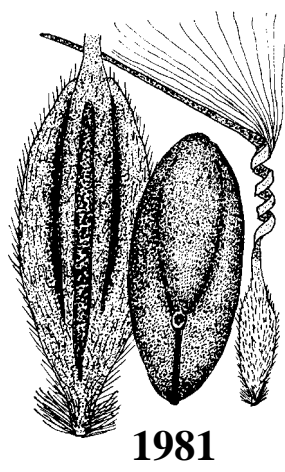
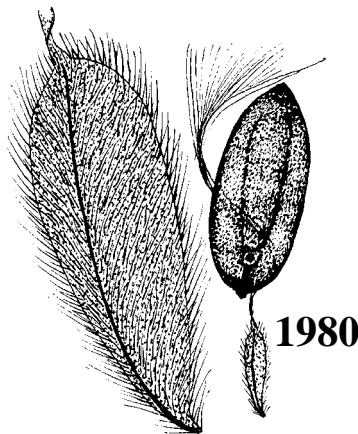
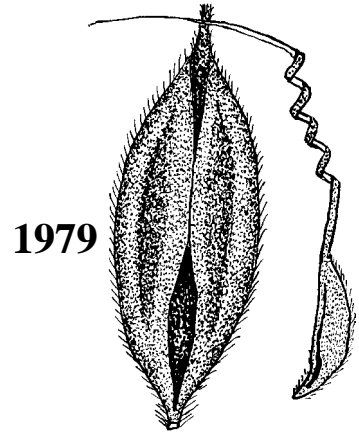
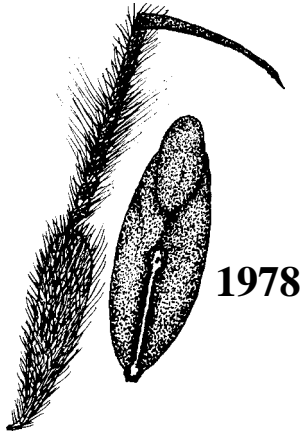
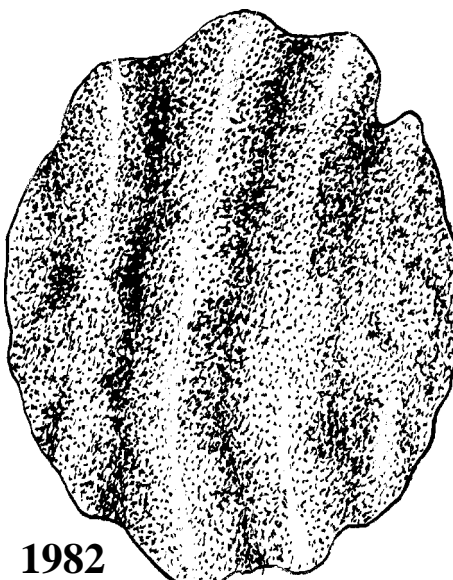
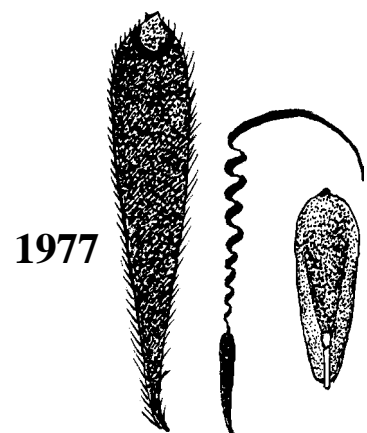
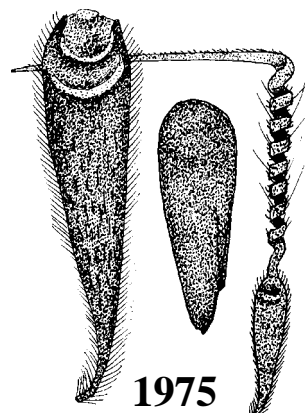
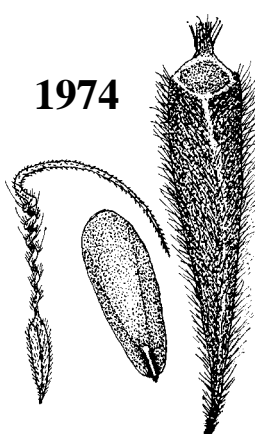
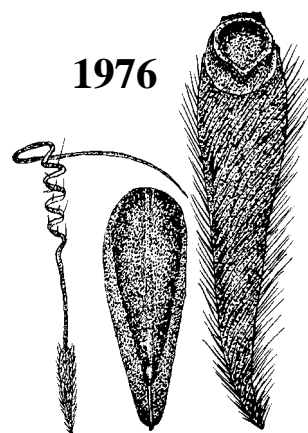
**1979. *Pelargonium peltatum* (L.) L'Hér., *Geranium peltatum* L.** – Perennial, with fleshy, peltate, 5-lobed leaves and procumbent stems. Mericarps smooth, hirsute, without ridges. **Fruits ellipsoid, dorsal side convex, ventral more or less flat, with spiral hook, 4-4.6 x 1.9-2.9 mm. Surface smooth, lustreless, hairy, cinnamon-brown.** Originally spread from southern Africa; widely cultivated for ornament, mostly in flowerpots.

**1980. *Pelargonium radula* (Cav.) L'Hér., *Geranium radula* Cav.** – Perennial, shrub, stems  $\pm$  woody, up to 100 cm high, erect, branched, with fragrant, deeply pinnatisect leaves. **Fruits with spiral hook, 4.3-4.7 x 1.4-1.6 mm. Surface all hairy. Seeds prolonged ellipsoid, radicular lobe 4/5 of the cotyledonary lobe length, chalaza area rounded, raphe 1/5 of the seed length, 2.8-3.2 x 1.2-1.4 mm. Surface smooth to faint tuberculate, brown.** Native to southwestern Africa; in the Carpathians cultivated in flowerpots.

**1981. *Pelargonium zonale* (L.) Ait., *Geranium zonale* L.** – Perennial, shrub, stems erect or procumbent, 20-100 cm long, weakly wooded, 7-10 mm thick. **Fruits with spiral hook style column, 5.8-6.8 x 1.8-2.2 mm. Surface hirsute, longer hairs on base, on the end of beak spiral long hairs. Seeds ellipsoid, slight flattish, apex and base obtuse, radicular lobe 2/3 of the cotyledonary lobe length, chalaza area conical, raphe 1/3 of the seed length, 4.3-4.7 x 1.6-1.8 mm. Surface smooth to faint reticulate, reddish-brown.** Native to southern Africa; commonly cultivated on balconies and in flowerpots as a domicile plant.

## 78. TROPAEOLACEAE

**1982. *Tropaeolum majus* L.** – Annual (perennial), stems glabrous, procumbent or twining (50-150 cm), or ascendent and branched (10-30 cm). **Fruit segments globose or ovoid, convex with 3-6 broader ribs on dorsal side, flat with longitudinal crack on ventral side, 8-12 x 8-10 mm. Surface smooth, dull, dirty white or yellowish-white.  $2n = 28$ .** Originally growing



in South America; in the Carpathians commonly cultivated in gardens, parks, balconies, often escaping and naturalized. Hu, Mo, Ro, Sk, Uk.

**1983. *Tropaeolum minus* L., *T. pulchellum* Salisb.** — Annual (perennial), a small plant, shrub, 30-40 cm high. **Fruits segments obovoid, convex on dorsal side, with 4-6 broader ribs or furrows, sometimes with slaty structure, 6-7.5 x 4.3-4.9 mm. Surface tuberculate, dull, dirty white to brownish.** Native to South America; rarely cultivated in gardens and parks. Mo, Ro, Uk.

**1984. *Tropaeolum peltophorum* Benth.** — Annual, a trailing plant, up to 5 m high, pubescent. **Fruits segments obovoid, convex on dorsal side, with 5-6 or more broader ribs and furrows, 7.3-8.2 x 5-5.8 mm. Surface tuberculate, dull, dirty-white to brownish.** Native to the mountains of South America (Columbia); sporadically cultivated as a ornamental plant. Ro.

**1985. *Tropaeolum pentaphyllum* Lam., *Chymocarpus pentaphyllus* D. Don** — Annual, glabrous, up to 4 m high, with tendrils. **Fruit segments of sectorial type, convex, dorsal side with 3 ribs, acuminate on ventral side, 6-6.6 x 4.2-4.6 mm. Surface glabrous, dull, dark-brown.** Originally spread from South America, introduced into Europe, inclusive the Carpathians, rarely cultivated in gardens, its fruits are comestible.

## 79. ZYGOPHYLLACEAE

**1986. *Zygophyllum fabago* L.** — Perennial, stems erect, 60-100 cm high, ramified, smooth, articulated, nodes roughened. **Seeds oval or rhomboidal, lateral compressed, 4.3-4.9 x 2.4-2.8 mm. Surface blackish with foamy covering whitish or pale-brown.  $2n = 22$ .** Native to Eurasia, on littoral arid places. Mo, Pl, Ro, Uk.

**1987. *Tribulus terrestris* L., *T. orientalis* A. Kern.** — Annual, procumbent, stems 10-60 cm long, poorly ramified, pubescent. **Fruits triquetrous, woody burr with sharp, rigid spines, flattish, apex with two pointed teeth, one stronger and one weaker thorn on each side, accompanied by several smaller spikes, 7-8 x 5-6 mm. Surface wrinkly, dull, straw-yellow or straw-grey.  $2n = 12, 24, 36, 48$ .** Native of Eurasia, on sandbanks, sandy fallows of warmer areas. Hu, Mo, Ro, Sk, Uk.

## 80. PEGANACEAE

**1988. *Pegnum harmala* L.** — Perennial, stems 30-60 cm high, erect or ascendent, many-branched. **Seeds irregularly triangular, cuneiform-oval, undulated, distinctly increased, dorsal side broad oval, ventral side narrow, 3.2-3.6 x 2-2.4 mm. Surface tuberculate, dull, brown, ribs pale, undulated, distinct increased.** Native to the Balkan Peninsula, in waste places, saline steppes, stony slopes. Hu, Mo, Ro, Uk.

## 81. MELIACEAE

**1989. *Melia azerdarach* L.** — Tree or shrub, up to 15 m, bark furrowed, leaves 2-pinnated, flowers lilac, fragrant. **Fruits capsules,  $\pm$  spherical with 7 ribs and 7 seeds inside, 8-8.6 x 8-8.6 mm. Seed prolonged ovoid, apex narrowed with small boss, lateral compressed, hilum oval, yellowish, 5.5-6.5 x 2.2-2.5 mm. Surface dull, smooth, dark-brown, slight wrinkly.** Native to southern and eastern Asia; in the Carpathians rarely planted in the warmest areas in parks for ornament, locally naturalized.

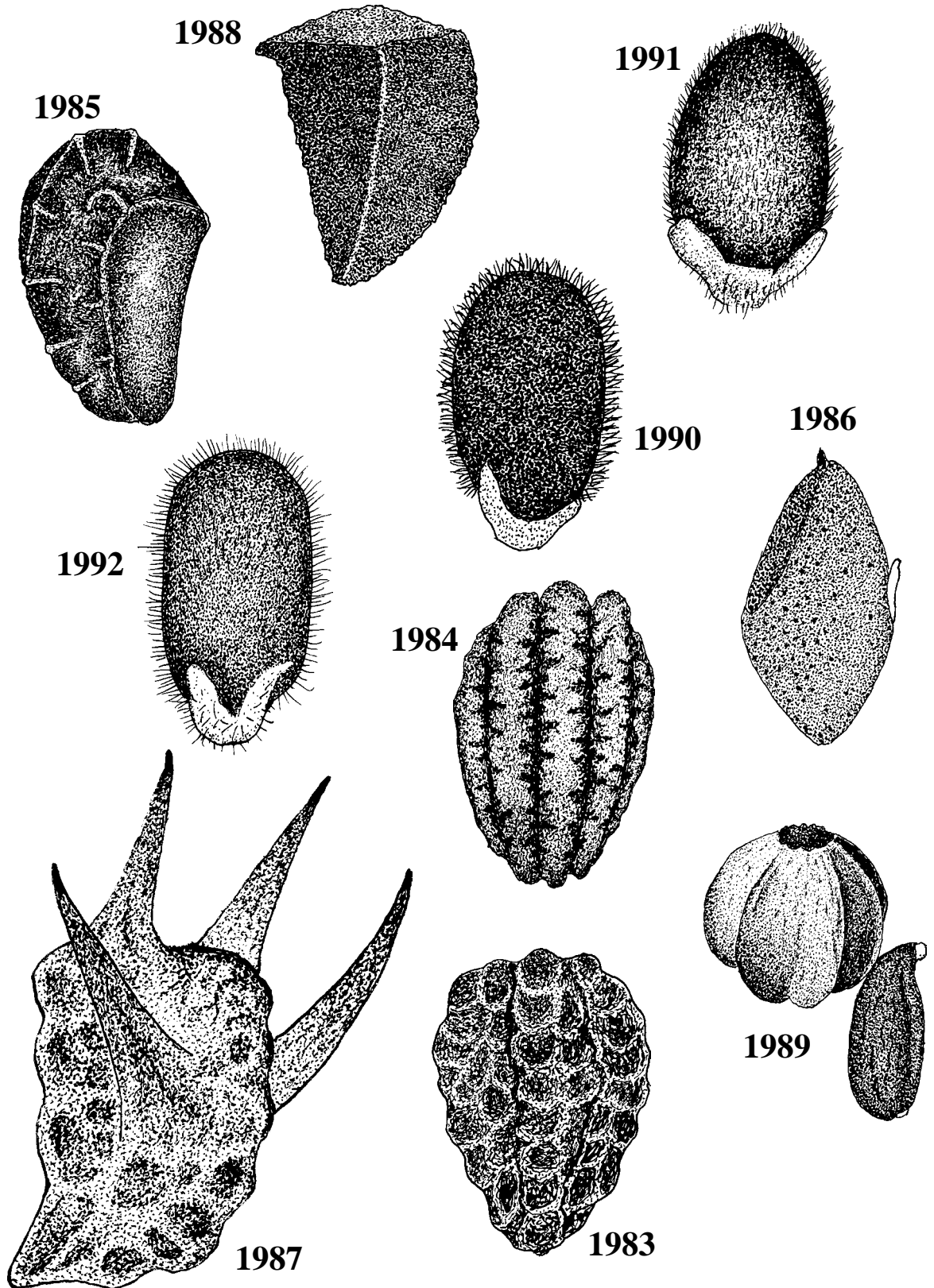
## 82. POLYGALACEAE

**1990. *Polygala alpestris* Rchb.** — Perennial, stems small, 7-15 cm high, slender, ascending or prostrate. **Seeds ellipsoid, apex rounded, hilum caruncle c. 1/3 of the seed length, 2.1-2.5 x 1.2-1.4 mm. Surface dense covered with whitish hairs, dull, blackish.  $2n = 34$ .** Native to Europe, in grassy areas, wet stony, lumpy stands, in alpine and subalpine zones, rarely Ro, Uk.

**1991. *Polygala amara* L., *P. amblyptera* Rchb.** — Perennial, stems unramified, 5-2 cm, tufted, leafy rosette erected from ground. **Seeds ovoid, apex rounded, with a whitish aril at the base, 1.8-2.4 x 0.9-1.3 mm. Surface smooth, lustrous dense hairy, blackish.  $2n = 28$ .** Native to eastcentral Europe, in mountains in semidry turfs, damp meadows, grows in chalky soil, which is damp in winter and dry in summer. Hu, Mo, Pl, Ro, Sk.

**1992. *Polygala amarella* Crantz, *P. austriaca* Crantz** — Perennial, stems 5-20 cm high, leafy. **Seeds ellipsoid, aril whitish, three lobes, 1.7-1.9 x 0.9-1 mm. Surface smooth, lustrous, hairy, black.  $2n = 34$ .** Native to central Europe, on moist humous meadows, fanlands, river heads, calcareous soils, from lowland to subalpine zones; throughout the Carpathians.





**1993. *Polygala carniolica*** A. Kern., *P. nicaeensis* Risso ex Koch — Perennial, stems woody, ascendent at base, 10-40 cm high. **Seeds ellipsoid, slight flattish, whitish aril with three lobes, 2.3-2.6 x 1.1-1.3 mm. Surface smooth, lustreless, blackish-brown.** Native to Carpathians and the Balkan Peninsula, on grassy sunny downs; the distribution in the Carpathians unknown. Au, Sk (?).

**1994. *Polygala comosa*** Schkuhr — Perennial, stems 7-40 cm high, ascendent to erect. **Seeds ellipsoid, apex rounded, aril with longer ventral lobes, 2.1-2.5 x 1-1.2 mm. Surface smooth, lustrous, dense hairy, black. 2n = 28-32, 34.** Native to Europe, in dry meadows, shrubberies, waste places, calcareous soils; in warmer areas of the whole Carpathian region.

**1995. *Polygala major*** Jacq. — Perennial, 15-60 cm high, stems tufted, ascendent up to erect, scattered puberulent, unramified. **Seeds ellipsoid to ovoid, arillate, aril basal, yellowish with three lobes, 2.7-3.1 x 1.2-1.4 mm. Surface smooth, lustrous, hairy, black. 2n = 32.** Native to Eurasia, in grassy stands, forest edges, shrubberies, boundaries, rocky slopes, at altitudes of up to 2500 m. Hu, Mo, Pl, Ro, Sk, Uk.

**1996. *Polygala vulgaris*** L., *P. multicaulis* Tausch., *P. oxyptera* Rchb. — Perennial, stems ascending to erect, 7-35 cm high, bare or sparsely hirsute, simple. **Seeds ellipsoid, slight flattish, aril yellow with three lobes, 2.5-2.9 x 1.3-1.5 mm. Surface smooth, lustreless, hairy, black. 2n = 28, 32, 48, 56, 68, 70.** Native to Eurasia, on meadows, mountain pastures, sandy soils rich in humous, a calcifuge; throughout the Carpathians.

**1997. *Polygaloides chamaebuxus*** (L.) O. Schwarz, *Chamaebuxus alpestris* Spach — Perennial, 5-25 cm high, stems ramified, from numerous shoots tufted, procumbent or ascendent. **Seeds ellipsoid to ovoid, arillate, aril basal, conspicuous, whitish, with two lobes, 4.8-5.2 x 2.9-3.2 mm. Surface smooth, dense hairy, lustrous, dark-brown. 2n = 38, 46.** Native to mountains of central and southern Europe, in woods, pastures and on rocky slopes. Hu, Ro (?).

### 83. RUTACEAE

**1998. *Ruta angustifolia*** Pers. — Perennial, stems 25-75 cm, glabrous below the infloresces, lower leaves shortly petiolate, obovate-lanceolate to narrowly oblong. **Seeds ± half-moon, dorsal side convex, ventral rooflike, with hilum in the centre, 1.5-1.7 x 1.1-1.2 mm. Surface reticulate-foveate,**

**faint lustrous or dull, dark-brown to black.** Native to the western Mediterranean region, extending to Yugoslavia; temporarily hauling into the warmest regions of the Carpathians.

**1999. *Ruta divaricata*** Ten., *R. graveolens* L. subsp. *divaricata* Gams. — Shrub, 15-40 cm high, leaves oval or ovoid, leaflets oblong lanceolate, plant faint aromatic. **Seeds ellipsoid, lateral slight flattish, dorsal side convex, ventral concave or flat, with a large hilum, 2.6-2.9 x 1.4-1.6 mm. Surface verrucate, dull, dark-greyish to black.** Native to the Mediterranean; on dry stony and gravelly stands, in shrubberies. Mo, Ro, Uk.

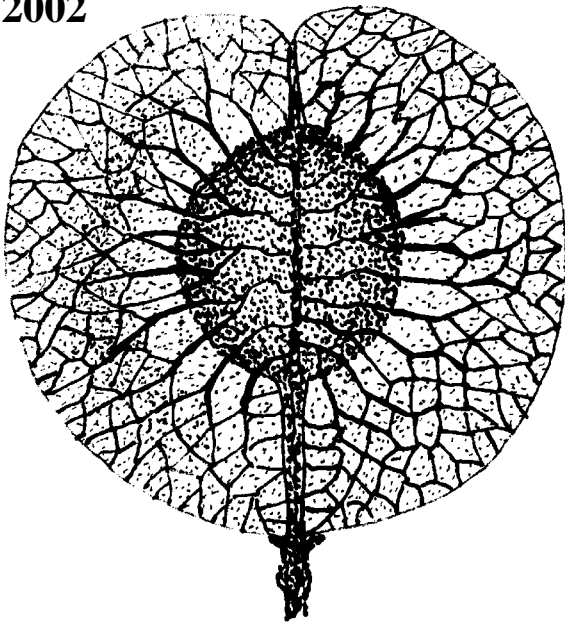
**2000. *Ruta graveolens*** L. — Perennial, strong aromatic, glabrous, stems erect, 20-50 cm high, ramified, leafy. **Seeds reniform, lateral rooflike and slight compressed, dorsal side convex, ventral concave, 2-2.2 x 1.5-1.7 mm. Surface humped, lustreless, blackish. 2n = 72, 81.** Native to south-eastern Europe, on sunny, alkaline soils; in the past cultivated in gardens as a medicinal and aromatic plant, widely naturalized, in sunny open soils, waste places, nearly in all Carpathian territories.

**2001. *Dictamnus albus*** L., *D. fraxinella* DC. — Perennial, stems 40-80 cm high, erect, woody at base, ± unramified, shortly downy, glandular. **Seeds obovoid, apex rounded, base constricted with a white stripe extending up to the half of the seed, 3.6-4 x 2.9-3.1 mm. Surface smooth, glossy, black. 2n = 36.** Native to southern Eurasia, on dry, stony or sandy, calcareous soils in warmer areas, shrubberies, light forests, clearings. Hu, Mo, Pl, Ro, Sk, Uk.

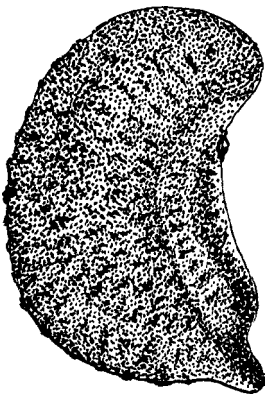
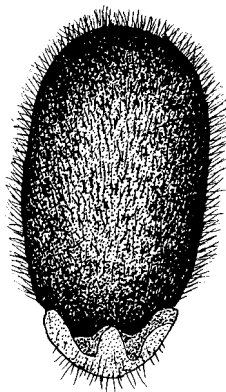
**2002. *Ptelea trifoliata*** L. — Shrub or small tree, up to 8 m high with globose corona, twigs in young stage brownly hirsute. **Fruits achenes, flattish, encircled by a thin papery, net-veinous wings, 15-22 x 17-25 mm. Surface with netted nervation, leathery, dull, pale-brown. 2n = 36, 42.** Originally growing in North America, often cultivated in parks, seldom naturalized, a decorative tree with flowers and seeds locally naturalized. Hu, Ro, Sk, Uk.

**2003. *Citrus deliciosa*** Ten., *C. nobilis* Lour., *C. reticulata* Blanco — Small, spreading tree, twigs spiny, slender, flowers solitary or in small clusters. **Seeds ± ellipsoid, apex acuminate, bottom narrowed, truncate, lateral slight flattish, 9-10 x 5-6 mm. Surface smooth or faint waved, slight lustrous or dull, yellowish-white. 2n = 18, 36.** Native to China; in the

2002

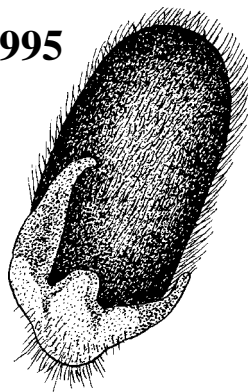


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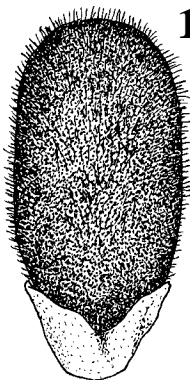


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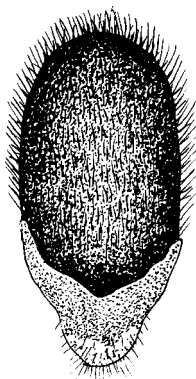
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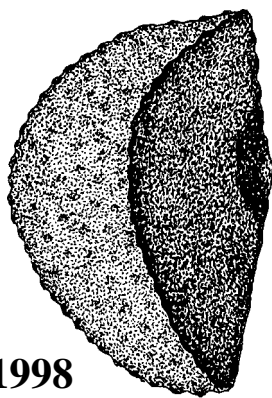
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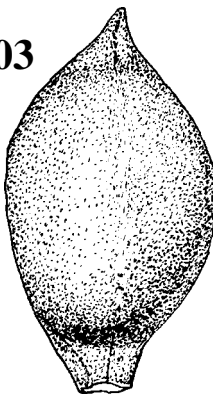
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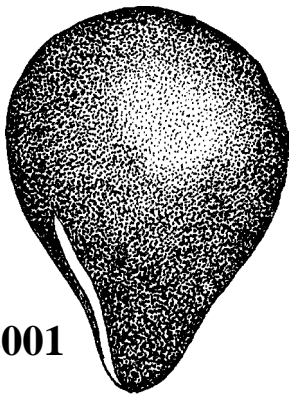
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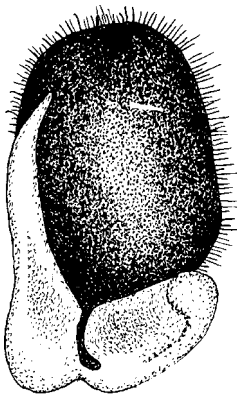
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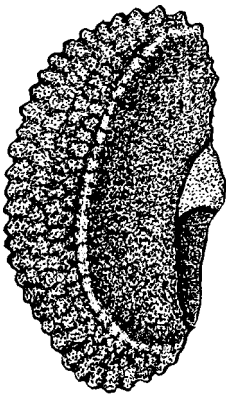
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1997



1999



Carpathians rarely cultivated in interiors and greenhouses as an attractive shrub.

**2004. *Citrus limon* (L.) Burm. fil.** — Thorny shrub up to 4 m high, strong ramified, leaves leathery. **Seeds obovoid, apex and base constricted, 8-10 x 4.7-5.3 mm. Surface faint tuberculate, lustreless, yellowish-white to yellowish-orange. 2n = 18, 36.** Originally growing in the Himalayas, at present commonly cultivated in subtropical and tropical climate; in the Carpathians rarely cultivated in greenhouses or flowerpots.

**2005. *Citrus medica* L.** — Shrub to tree, evergreen, 3-5 m high, thorny, young twigs pinkish. **Seeds ± oval, lateral slight compressed, apex blunt acuminate, bottom ± truncate, 10-13 x 5.9-6.4 mm. Surface glabrous, lustreless, yellowish.** Native to Asia and southern Europe; in the Carpathians rarely cultivated in hothouses for its fruits.

**2006. *Citrus sinensis* (L.) Osbeck** — Shrub or small tree, up to 10 m high, strong ramified. **Seeds prolonged elliptic, apex and base constricted, 11-13 x 6-7 mm. Surface faint tuberculate, lustreless, yellowish. 2n = 18, 27, 36, 45.** Native to the Himalayas, now commonly cultivated in subtropical and tropical climate as an important tree bearing fruits rich in vitamins; in the Carpathians sometimes cultivated in greenhouses.

**2007. *Poncirus trifoliata* (L.) Raf., *Citrus trifoliata* L.** — Shrub or tree up to 7 m high, thorny. **Seeds prolonged obovoid, mostly triangular, with a distinct suture on ventral side, 9.5-11.5 x 4.8-5.6 mm. Surface smooth, lustrous, dirty greyish-white.** Originally growing in the Himalayas, central China and Korea; cultivated in orchards and parks as an ornamental and used as frost-resistant understock for growing citrus species. Hu, Ro, Sk, Uk.

**2008. *Zanthoxylum americanum* Mill., *Xanthoxylum americanum* Mill.** — Aromatic shrub or tree, up to 6-8 m high, twigs downy, thorny. **Seeds irregular globose, hilum conical, 3.8-4.2 x 3.1-3.4 mm. Surface depressed in some places, smooth, glossy, black.** Originally growing in North America; in the Carpathians rarely cultivated in parks, in warmer areas.

**2009. *Phelodendron amurense* Rupr.** — Tree, bark on trunk corked, twigs yellow-orange. **Seeds**

**obovoid, planoconvex, dorsal side broad convex, ventral side constricted into a longitudinal raphe, 4.4-4.8 x 2.7-3 mm. Surface reticulate-areolate, lustreless, pale to dark-brown or black.** Originally growing in eastern Asia; in the Carpathians rarely cultivated in parks as an ornamental. Ro, Sk, Uk.

**2010. *Evodia hupehensis* Dode.** — Tree, up to 20 m high, young twigs downy. **Seeds obovoid, dorsal side rounded, ventral side flat, with a whitish stripe, apex with humplet, 3-3.4 x 2.1-2.4 mm. Surface smooth, glossy, black.** Originally growing in central China; in the Carpathians rarely cultivated in parks and town verdure.

#### 84. SIMAROUBACEAE

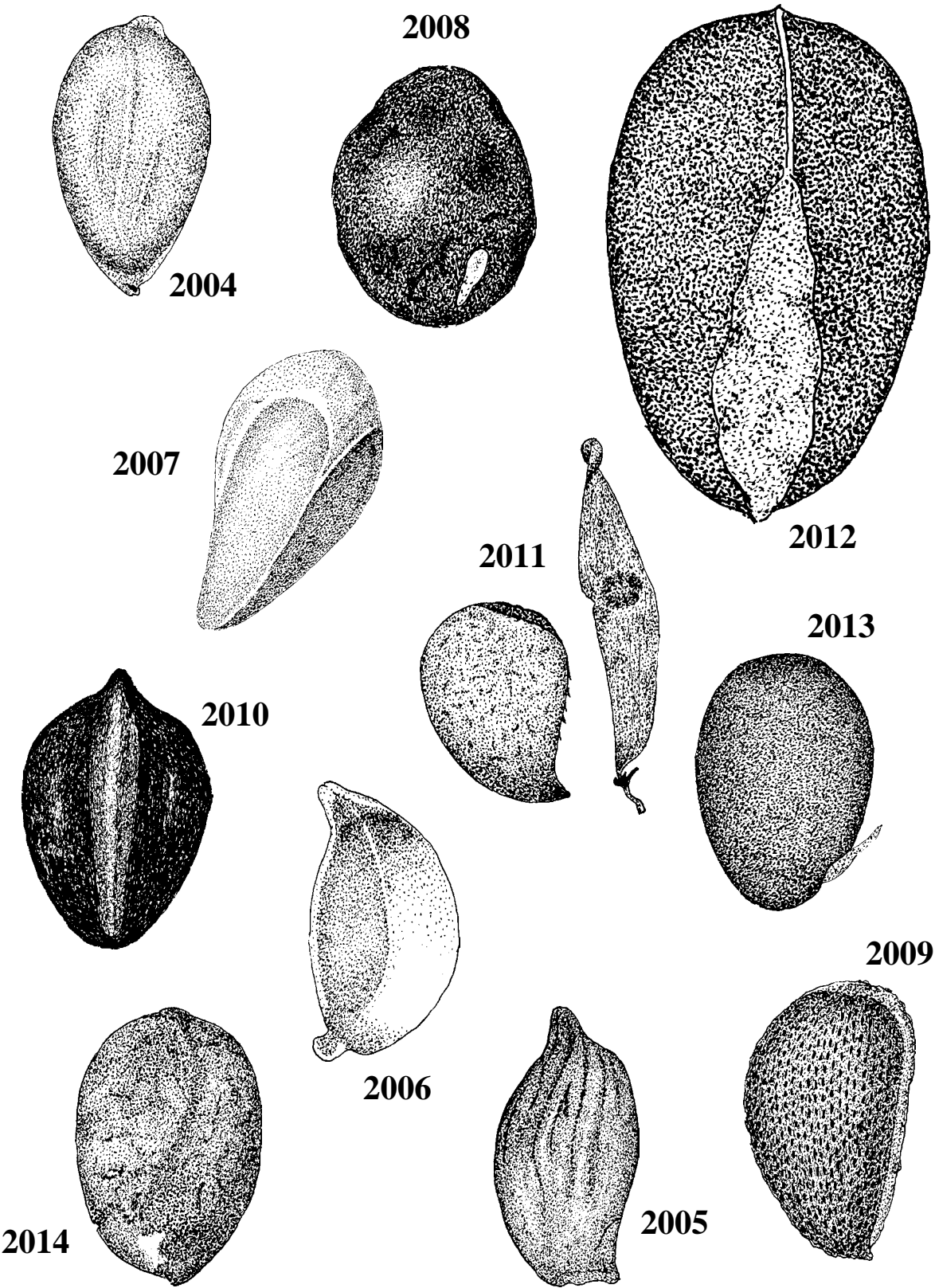
**2011. *Ailanthus altissima* (Mill.) Swingle, *A. glandulosa* Desf.** — Robust tree, up to 20 m high, bark dark-grey, twigs in young stage yellowish-red, hirsute. **Fruits (right) prolonged, winged achenes, c. 50 x 10 mm. Seeds (left) ovoid with a strong crooked apex, base truncate with a long linear hilum, 4.5-5.5 x 3.7-4.2 mm. 2n = 80.** Originally growing in China; in the Carpathians plating in parks, alleys and town verdure for ornament and soil conservation.

#### 85. CELASTRACEAE

**2012. *Euonymus atropurpureus* Jacq.** — Shrub, to small tree, up to 8 m high, flowers purple, c. 10 mm in diam., leaves 4-12 cm long, elliptic. **Seed obovoid or elliptic, surrounded by an aril, 6.5-7.5 x 4-4.5 mm, without the aril, 6-7 x 4-4.5 mm. Surface of the aril wrinkly, orange, own seed smooth brownish-violet.** Native to North America, rarely cultivated in parks, own verdure and gardens.

**2013. *Euonymus europaeus* L., *E. vulgaris* Mill.** — Shrub or small tree, 2-6 m high, dense ramified, twigs green, 4-angular, narrowly winged. **Seeds broad ellipsoid, completely enclosed into an orange, fleshy aril, hilum conical, broadest towards the base, 5.8-6.6 x 3.8-4.2 mm. Surface glabrous, lustrous, pale to light-brown. 2n = 64.** Native to Europe, in lowlands and uplands, in moist stands, up to 700 m; in all Carpathian territories.

**2014. *Euonymus japonicus* Thunb.** — Shrub or small tree, up to 6 m high, twigs erect, weakly angular, grey. **Seeds ellipsoid to ovoid, with the rest of aril on surface, 4.5-5.5 x 3.2-3.8 mm. Surface tuberculate, lustreless, yellowish-brown. 2n = 32.** Native



to Japan; in the Carpathians planted for ornament in parks and locally naturalized. Hu, Ro, Sk, Uk.

**2015. *Euonymus latifolius* (L.) Mill., *Kalonymus latifolia* (Mill.) Prokh.** — Shrub, twigs indistinct quadrangular,  $\pm$  flattish. **Seeds ovoid to ellipsoid with suture from the hilum up to the apex, hilum broadest towards the base, 5.5-6.5 x 4-4.5 mm. Surface faint reticulate, lustrous, brown.** Native to the Mediterranean, mostly in calcareous stands; often cultivated in parks. Ro, Sk, Uk.

**2016. *Euonymus nanus* M. Bieb.** — Shrub, up to 25-200 cm high, procumbent or ascending, twigs quadrangular. **Seeds obovoid, biconvex, ventral side with a longitudinal furrow with elaiosome on the bottom part, 4.3-3.8 x 2.5-2.8 mm. Surface smooth or fine scrobiculate, slight lustrous, rose-purple.** Native to southeastern Europe, scarcely on rock split, shrubberies, up to 800 m, rarely cultivated in parks, town verdure. Mo, Ro, Uk.

**2017. *Euonymus radicans* Sieb. et Miq., *E. fortunei* (Turcz.) Hand.-Mazz.** — Procumbent, creeping to climbing or trailing shrubs with adhesive roots. **Seeds obovoid or ellipsoid, dorsal side convex, ventral side mostly flat, often with the rest of aril, 5.4-6 x 3.4-3.8 mm. Surface smooth or wrinkly, reddish-violet.** Native to Japan; introduced into Europe and often cultivated in parks and gardens. Ro, Sk.

**2018. *Euonymus verrucosus* Scop.** — Small, deciduous shrub, 1-3 m high, dense ramified, twigs thin, green, rounded, brownly verrucose. **Seeds obovoid, apex rounded, hilum conical, broadest towards the base, 4.5-4.9 x 3.3-3.7 mm. Surface slight wrinkly, lustrous, reddish-black to black. 2n = 32.** Native to eastern and central Europe, in calcareous soils, woods, rocks, shrubberies of warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**2019. *Celastrus orbiculatus* Thunb., *C. articulatus* Thunb.** — Liana, up to 12 m high, shoots spirally turned around sustainer. **Seeds ovoid, dorsal side convex, ventral flattish, with a longitudinal, shallow rib, 3.6-4 x 2.5-2.8 mm. Surface fine scrobiculate, slight lustrous, rose-brown.** Native to the Far East, China and Japan, on rocky and stony slopes; in the Carpathians very rarely planted in parks as an ornamental.

**2020. *Celastrus scandens* L.** — Liana, spirally turned around sustainer, up to 7-8 m high. **Seeds ellip-**

**soid, dorsal side convex, ventral slight flattish, longitudinal ribbed, apex with low beak, 5-5.89 x 2.5-2.9 mm. Surface smooth or scrobiculate, slight lustrous, violet-brown.** Originally spread from North America, in nutrient-rich soils; in the Carpathians often planted as an ornamental in parks and gardens, in warmer areas.

## 86. AQUIFOLIACEAE

**2021. *Ilex aquifolium* L.** — Evergreen shrub, 1-5 m high, with a dense, pyramidal corona, twigs pale-grey. **Stones ellipsoid, slight dorsoventral flattish, with a sharpened point, irregular ridged to veinous, ridges usually forked and undulated, 6-7 x 3.4-3.8 mm. Surface tuberculate, lustreless, yellowish-brown, ridges usually pale. 2n = 40.** Originally growing in southern and western Europe; in the Carpathians sometimes planted in parks, gardens and town verdure. Hu, Ro, Sk.

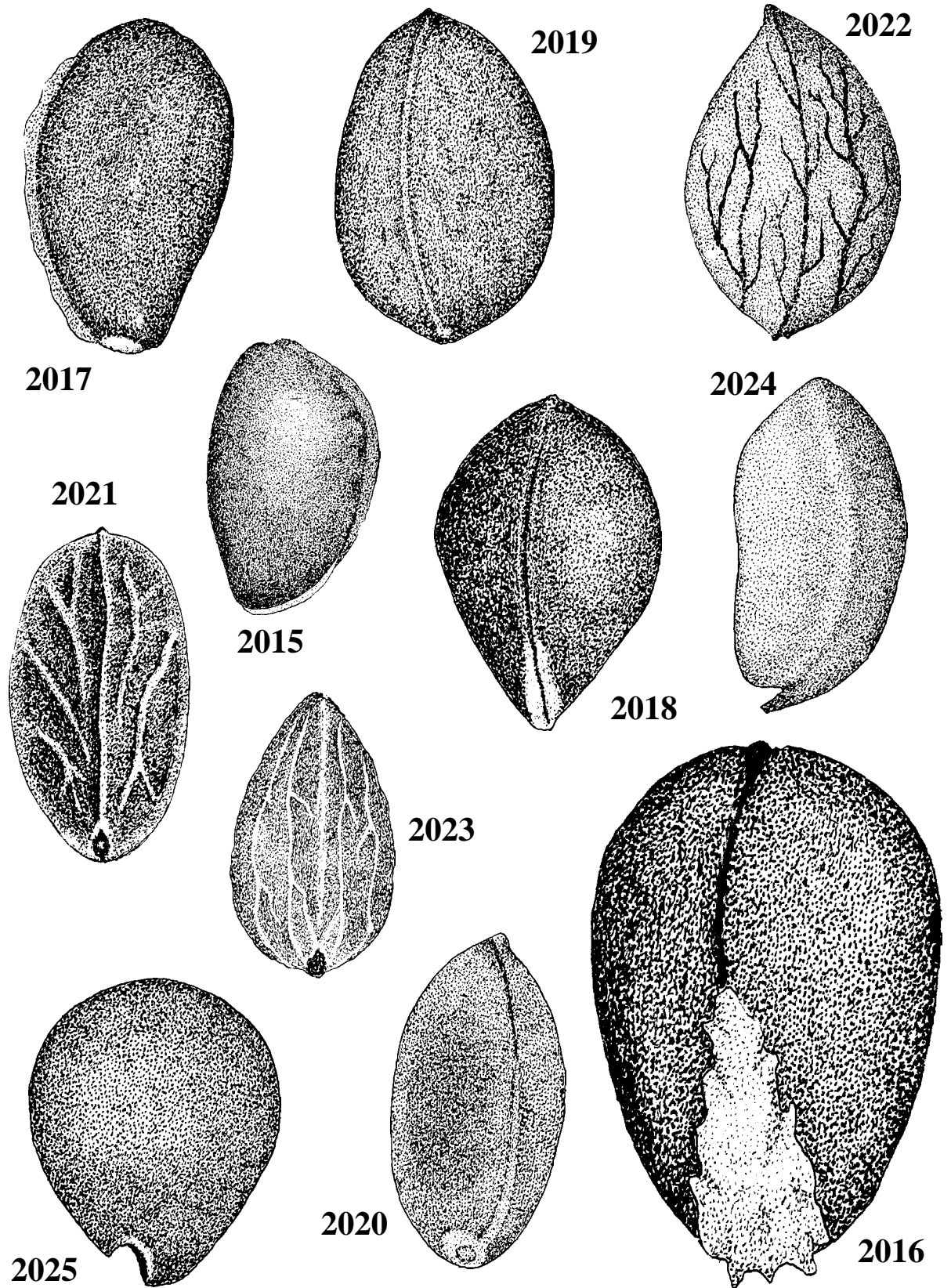
**2022. *Ilex crenata* Thunb., *I. fortunei* hort.** — Shrub, very branched to a small tree, up to 7 m high, young twigs fine pubescent, leaves elliptic to lanceolate, fruit globular, 5-6 mm, black. **Stones ovoid, apex acuminate, with a sharp point, 4-5 x 2.5-3 mm. Surface veinous, dull, whitish- or pale-brown.** Native to Japan; in the Carpathians rarely cultivated in parks as an ornamental.

**2023. *Ilex pernyi* Franch.** — Shrub, up to 10-20 m high, twigs short and lay-out, corona pyramidal or oblong. **Stones ovoid, dorsal side convex, ventral rooflike, 5-5.5 x 2.8-3.2 mm. Surface smooth, veinous, dull, reddish-brown.** Native to western and southern Europe, western Asia, northern Africa; in the Carpathians rarely cultivated in parks in some varieties.

**2024. *Ilex verticillata* (L.) A. Gray** — Shrub, up to 3 m high, with spreading twigs, leaves elliptic or oblong lanceolate, 3.5-7 cm long, acuminate, serrate. **Stones elliptic, dorsal side convex, ventral rooflike, convex, 3.2-3.8 x 1.6-2 mm. Surface smooth, faint lustrous, ochreous.** Native to North America; in the Carpathians rarely cultivated in parks as an ornamental.

## 87. STAPHYLEACEAE

**2025. *Staphylea colchica* Stev.** — Tree or shrub, up to 2-5 m high, leaves odd, usually 6 on unfertile twigs, and 3 leaves on fertile twigs, flowers white, aromatic. **Seeds broad obovoid, lateral slight**



compressed, apex rounded, bottom narrowed, with a large roundish hilum, 6.4-7 x 5.5-6 mm. Surface glabrous, slight lustrous, pale-brown. Native to the West Caucasus, on woody steppes; in the Carpathians cultivated in gardens and parks as an attractive tree. Uk.

**2026. *Staphylea pinnata* L.** — Shrub or tree, up to 5 m high, young twigs hirsute, green, bare, brown, lustrous later on. **Seeds globular or obovoid, slight flattish, hilum big, rounded, near to the apex ascendent bulges on both sides, 10-12 x 9-10 mm. Surface slight foveolate, lustrous, smooth, brown. 2n = 26.** Native to Eurasia, in deciduous forests, shrubberies, overgrown rocks and gorges, at altitudes up to 1300 m. Au, Hu, Pl, Ro, Sk, Uk.

**2027. *Staphylea trifolia* L.** — Tree or shrub, up to 2-5 m high, leaves triple, ellipsoid or ovoid, hirsute below. **Seeds spheric or slight ellipsoid, lateral faint compressed, hilum roundish, 6-6.4 x 5.4-5.8 mm. Surface glabrous, high glossy, pale-brown.** Native to North America; in the Carpathians rarely cultivated in gardens and parks as a decorative species. Uk.

## 88. SANTALACEAE

**2028. *Thesium alpinum* L., *Th. tenuifolium* Sauter** — Perennial, stems ascending or erect, 10-25 cm high, simple or slight branched. **Fruits achenes, subglobose or globose, persistent perianth at apex, subtubular, 2-3 times as long as the achenes, radicle as long as or slightly longer than cotyledons, 4.5-5.5 x 1.7-2.1 mm. Surface fine waved, longitudinal distinct veinous, lustrous, yellowish-or greenish-brown. 2n = 12.** Native to Europe, on sunny grassy slopes, forest clearings, mountain meadows, on neutral to slightly acid soils. Br, Pl, Ro, Sk, Uk.

**2029. *Thesium bavarum* Schrank, *Th. montanum* Ehrh. ex Hoffm.** — Perennial, stems erect, 30-60 cm high, unbranched. **Fruits achenes, ellipsoid, 4-5 times longer than the persistent perianth, 3.2-3.8 x 1.6-2 mm. Surface with 5 ribs and distinct branched veins, lustreless, yellowish-brown. 2n = 24.** Native to Europe, in light woods, wood margins, shrubberies. Hu, Pl, Ro.

**2030. *Thesium divaricatum* Jan ex Mert et Koch** — Perennial, stems 15-35 cm high, ascending or erect, robust, rigid, many-branched. **Fruits achenes, ovoid to subglobose or ellipsoid, 5-times as long as the persistent perianth, perianth broad campanulate,**

**5-lobed, 4.2-4.4 x 1.6-1.8 mm. Surface faint waved and lustrous, yellowish or greenish pale-brown.** Native to the Mediterranean, in arid places, coastal shrubberies and hills. Ro.

**2031. *Thesium dollineri* Murb., *Th. simplex* Velen.** — Annual to perennial, stems 5-15 cm high, procumbent, ascending or erect, simple or branched. **Fruits achenes, more or less ovoid-globose, urceolate, 4-times as long as the persistent perianth, 3.3-3.7 x 1.5-1.7 mm. Surface with many visible, longitudinal, branched or unbranched veins, lustreless, yellowish-green.** Native to Europe, on pastures, boundaries, fallows, sandbanks. Hu, Pl, Ro, Sk.

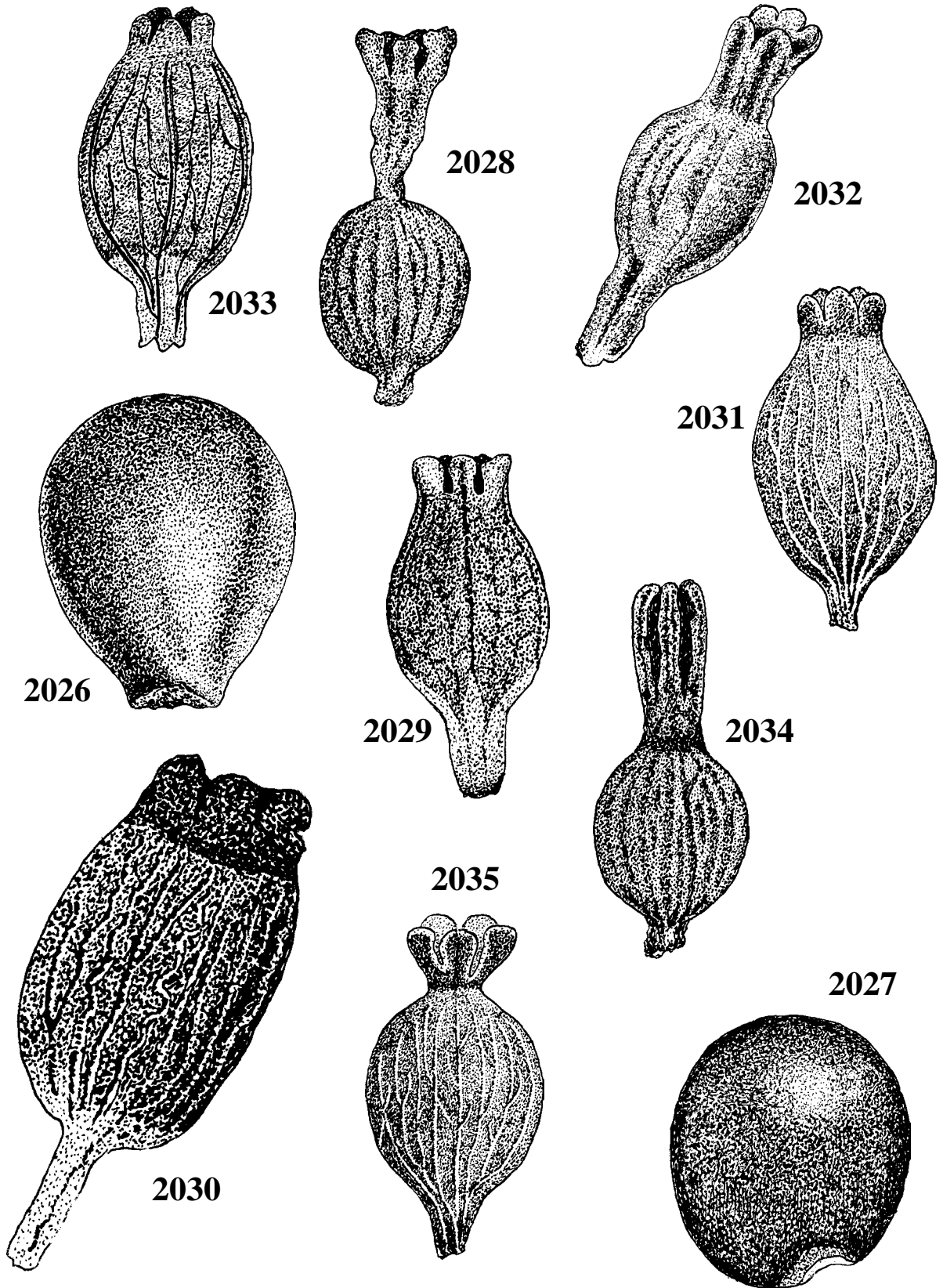
**2032. *Thesium ebracteatum* Hayne et Schrad.** — Perennial, stems 10-20 cm high, ascending up to erect, simple, rarely branched above. **Fruits achenes, ellipsoid to obovoid, perianth or bracteole shorter than the achenes, 5.7-6.2 x 1.8-2.2 mm. Surface longitudinally indistinct-veinous, dull, greenish-brown.** Native to Eurasia, in meadows, dried out moors. Br, Mo, Pl, Ro, Sk, Uk.

**2033. *Thesium linophyllum* L., *Th. intermedium* Schrad., *T. linifolium* Schrank** — Perennial, stems 10-30 cm, ascending or erect, unbranched, usually simple. **Fruits achenes, elliptic, 4-6 times longer than the persistent perianth, 3.5-4 x 1.8-2 mm. Surface with 5 ribs and distinct veins, lustreless, green or greenish-brown. 2n = 14, 24.** Native to Europe, on sunny, grassy steppe slopes, pastures, and in light woods; in all Carpathian territories.

**2034. *Thesium pyrenaicum* Pourr., *Th. pratense* Ehrh. ex Schrad.** — Perennial, caespitose, stems numerous, 10-25 cm high, ascending or erect, simple or branched. **Fruits achenes, ovate or elliptic, perianth tubular-campanulate, as long as the achenes, 4.5-5.5 x 1.7-1.9 mm. Surface glabrous, with distinct and strong veins, lustrous, yellowish-brown. 2n = 14.** Native to Europe, on submontane meadows, shrubby slopes and in light woods. Pl, Sk.

**2035. *Thesium ramosum* Hayne, *Th. arvense* Horv.** — Perennial, stems 10-30 cm high, ascending to erect. **Fruits achenes, elliptic, 3 times as long as the persistent, infundibular perianth, 3.5-4.1 x 1.8-2.2 mm. Surface indistinct ribbed or with only very small or no differences between the veins and the ribs, slight lustrous, yellowish-brown.** Native to





Eurasia, on dry meadows and pastures, steppe hills and stony slopes. Br, Hu, Mo, Ro, Sk, Uk.

**2036. *Thesium rostratum*** Mert. et Koch — Perennial, stems 10-30 cm high, stout, woody, not stoloniferous, ascending or erect, with some non-flowering branches. **Fruits achenes, globular, persistent perianth 2 (-3) times as long as the achenes, 5-lobed, 4.5-5.5 x 1.2-1.5 mm. Surface longitudinal distinct veinous, lusterless, yellowish to pinkish.  $2n = 26$ .** Native to Europe, in light woods, grassy and shrubby slopes, pine forests. Ro.

**2037. *Osyris alba*** L., *O. digyna* (L.) Hill. — Shrub, without a rhizome, stems up to 120 cm high, with many slender, spreading branches. **Fruits achenes globose, 5-7 mm in diam. Surface smooth, with some warfs, dull, pinkish.** Native to southern Europe; in the Carpathians very rarely cultivated in parks, in warmer areas.

## 89. LORANTHACEAE

**2038. *Loranthus europaeus*** Jacq. — Semiparasitic, epiphytic, dichotomically branched shrub, prostrate tuft, up to 1 m in diam. **Seeds  $\pm$  roundish, lateral compressed, apex slight narrowed, 3.5-4.1 x 2.3-2.7 mm. Surface strong wrinkly, humpy, dull, dark-brown.  $2n = 18$ .** Native to Europe, on oaks, mostly in lowland woods and warmer regions; in all Carpathian territories. Hu, Mo, Pl, Ro, Sk, Uk.

**2039. *Viscum abietis*** (Wiesb.) Fritsch., *V. album* subsp. *abietis* (Wiesb.) Abrom. — Perennial, parasite on *Abies*, leaves up to 8 cm long, berries white,  $\pm$  pyriform. **Seeds ellipsoid, lateral compressed, apex truncate, 4.2-4.6 x 2.9-3.1 mm. Surface smooth, longitudinal slight wrinkly and lustrous, dark-brownish, margin mostly convex, covered to yellowish-green membrane.  $2n = 20$ .** Native to Europe, only on *Abies alba*. Ro, Uk.

**2040. *Viscum album*** L. — Shrub, leaves cuneiformly prolonged, obovoid, 3-6 x 1-2 cm, berries white, roundish. **Seeds  $\pm$  reniform, lateral compressed, apex narrowed and blunt acuminate, bottom truncate, 4-4.7 x 3-3.8 mm. Surface slight longitudinal wrinkly, dull, dark greyish-brown, whole seed covered with a silverish membrane.  $2n = 20$ .** Native to Eurasia, on leafy trees, in leafy woods, rarely on shrubs, seldom on conifers; in all Carpathians.

**2041. *Viscum laxum*** Boiss. et Reuter, *V. album* subsp. *austriacum* (Wiesb.) Vollmann — Shrub, leaves

2-8 cm, cuneiformly prolonged, berries white or yellowish with 1 seed. **Seeds shovel-shaped, lateral compressed, 3.7-4.2 x 3.1-3.3 mm. Surface longitudinal wrinkly, slight lustrous, greyish-brown, covered within a yellowish-white membrane.  $2n = 20$ .** Native to Europe, a semiparasite on coniferous trees, mostly on *Pinus sylvestris*.

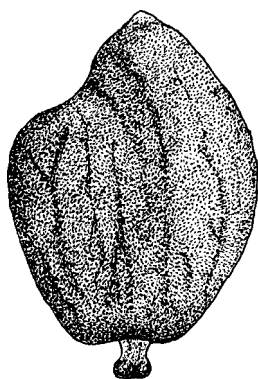
## 90. EUPHORBIACEAE

**2042. *Mercurialis annua*** L., *M. ambigua* L. — Annual, glabrous or scattered hirsute, stem branched mostly from base, erect, 10-50 cm high. **Seeds obovoid to broad obovoid, base with a distinct aril, chalazal area convex, 2-2.4 x 1.4-1.7 mm. Surface ruminate, lustreless, olive-grey.  $2n = 16$ .** Native to most of Europe, in cultivated grounds, waste places, at roadsides and hedges, woodlands, shrubberies; throughout the Carpathians.

**2043. *Mercurialis perennis*** L., *M. sylvatica* Hoppe — Perennial,  $\pm$  downy, stems erect, seldom ascending, 10-140 cm high, unramified, 4-angular, scaled on base. **Seeds broad obovoid, nearly globose, base with an inconspicuous aril, chalaza area not differentiated, 2.7-3.3 x 2.6-3.2 mm. Surface pitted and tuberculate, olive-grey.  $2n = 42$ .** Native to Eurasia, in shady places, vegetable fields, vineyards, gardens, wastelands, humous *Quercus*- or *Fagus*-woods; throughout the Carpathians.

**2044. *Chamaesyce humifusa*** (Willd.) Schlecht., *Euphorbia humifusa* Willd. — Annual, stems 2-20 cm high, leaves oblong-ellipsoid or oblong-obovoid. **Seeds obovoid, dorsal side convex, ventral rooflike, with a longitudinal furrow, apex truncate, bottom gradually narrowed, 1-1.2 x 0.7-0.8 mm. Surface shallowly wrinkly, dull, grey, with dark spots.  $2n = 22$ .** Native to eastern Asia; rarely hauling into the Carpathians on fields. Hu, Pl, Ro, Uk.

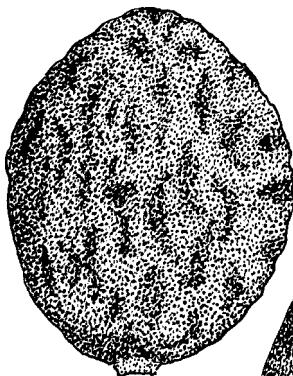
**2045. *Chamaesyce supina*** (Raf.) Moldenke, *Euphorbia maculata* auct. non L., *E. engelmannii* Jäggi et Schröt. — Annual, pubescent, stem up to 20 cm high, branched at base, procumbent, ascending. **Seeds ellipsoid quadrangular, longitudinal furrow on ventral side, apex truncate, bottom narrowed, 0.9-1.1 x 0.55-0.65 mm. Surface transversal foveolate, lustreless, grey.  $2n = 28$ .** Originally growing in North America, hauling into the Carpathians, rarely naturalized as a weed and the ruderal. Mo, Ro, Uk.



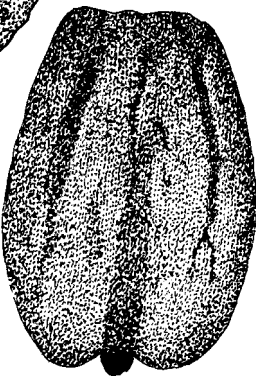
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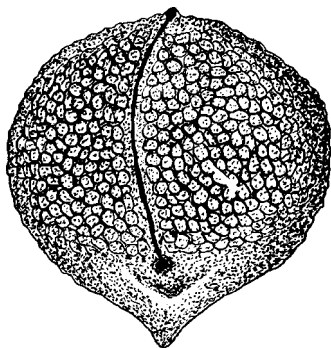
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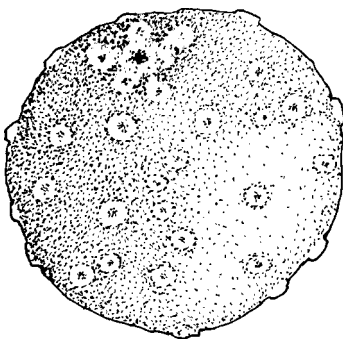
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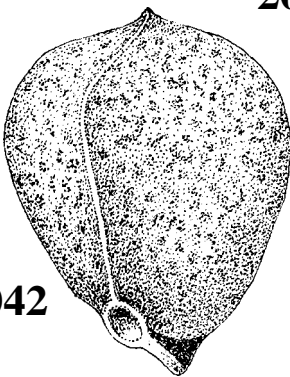
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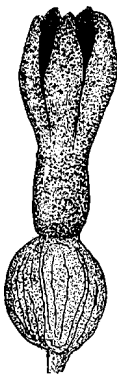
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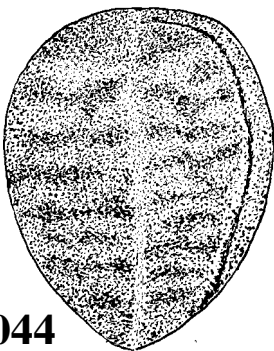
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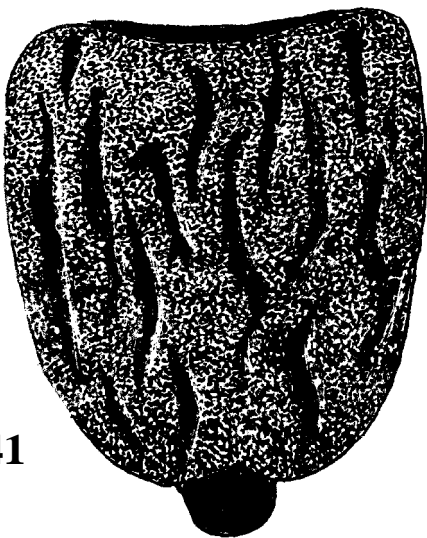
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2044



2041

**2046. *Securinega suffruticosa* (Pall.) Rehd., *S. ramiflora* Muell. Arg.** — Tree, up to 1-2 m high, with grey bark on old twigs. **Seeds obovoid, dorsal side convex, ventral rooflike, with a longitudinal rib in the middle, apex  $\pm$  truncate, bottom narrowed, 2.3-2.5 x 1.6-1.8 mm. Surface longitudinal shallow furrowed, glabrous, slight lustrous, pale-brown, scarce minutely spotted.** Native to northern and eastern Asia; in the Carpathians rarely cultivated as an ornamental and medicinal. Mo, Uk.

**2047. *Tithymalus amygdaloides* (L.) Gars., *Euphorbia amygdaloides* L.** — Perennial, downy, stems ascendent up to erect, simple, 10-90 cm high. **Seeds obovoid, arillate, 3-3.5 x 2.2-2.4 mm. Surface smooth, lustreless, dark-grey to black. 2n = 18, 20.** Native to Eurasia, in light woods, shrubberies, boundaries, semishaded deciduous forests, from lowland to mountain zones; throughout the Carpathians.

**2048. *Tithymalus austriacus* (A. Kern.) Á. et D. Löve, *Euphorbia austriaca* A. Kern., *E. villosa* Waldst. et Kit.** — Perennial, stout, glabrous or pubescent, stems numerous, scaly below. **Seeds slight obovoid, with a large aril below, 3-3.5 x 2.2-2.4 mm. Surface smooth, faint lustrous, brown.** Native to the eastern Carpathians, in damp meadows, open woods and on riverbanks. Hu, Mo, Pl, Ro, Uk.

**2049. *Tithymalus brittingeri* (Opiz) Holub, *Euphorbia verrucosa* L. em L.** — Perennial,  $\pm$  downy, stems numerous, 20-45 cm, rounded, unbranched. **Seeds elliptic, slight flattish, arillate, 2.2-2.6 x 1.5-1.7 mm. Surface smooth or verrucose, slight lustrous, brown or violet-brown. 2n = 14, 18.** Native to Europe on dry meadows, pastures, sunny shrubby slopes, woody steppes, boundaries, fallows. Hu, Ro, Sk.

**2050. *Tithymalus carniolicus* (Jacq.) Raf., *Euphorbia ambigua* Waldst. et Kit.** — Perennial, glabrous or slight pubescent, stems single, ascendent up to erect, angular, up to narrowly winged, 20-50 cm high. **Seeds globular to obovoid, arillate, 3-3.6 x 2.5-2.9 mm. Surface smooth, lustrous, brown to greyish-brown. 2n = 16.** Native to Europe, in mountain woods, on bushy slopes, forest steppes, shrubberies, from upland to subalpine zones. Ro, Uk.

**2051. *Tithymalus carpaticus* (Woloszczak) Á. et D. Löve, *Euphorbia carpatica* Woloszczak** — Perennial, stems up to 120 cm, ramified in the upper part,

some shoots are sterile, loculi hairy. **Seeds obovoid to elliptic, arillate, 3-3.4 x 2-2.3 mm. Surface smooth, glabrous, dark-brown.** Endemic to the East Carpathians, in marshy and damp stands. Ro, Uk, rarely.

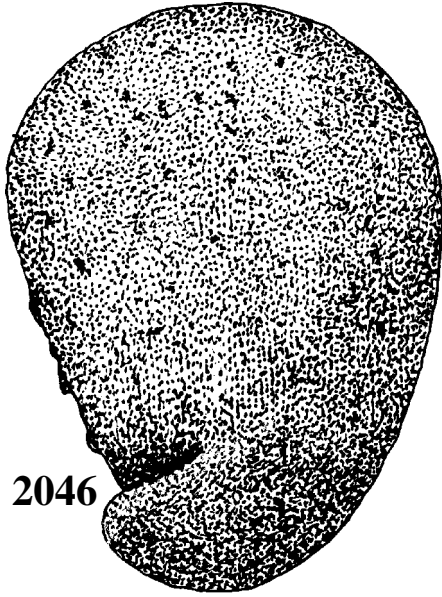
**2052. *Tithymalus cyparissias* (L.) Scop., *Euphorbia cyparissias* L.** — Perennial, glabrous, seldom downy, stems erect, 10-50 cm high, unbranched. **Seeds ellipsoid to broad ellipsoid, apex obtuse, aril subcircular,  $\pm$  convex, arillate, chalaza area convex, 1.9-2.3 x 1.4-1.6 mm. Surface smooth, lustrous, olive-grey to grey or nut-brown. 2n = 20, 40.** Native to most of Europe, common weed of warmer areas, on fields, roadsides, boundaries, embankments, in waste places; throughout the Carpathians.

**2053. *Tithymalus dulcis* (L.) Scop., *Euphorbia dulcis* (L.)** — Perennial, stems  $\pm$  single, ascendent, 20-30 cm high, slender scaled, fine sulcated, loosely hairy at base. **Seeds globular to ellipsoid, slight compressed, arillate, 2.5-3 x 2.2-2.5 mm. Surface smooth, lustrous, dark-brown. 2n = 12, 18, 24, 28.** Native to Europe, in damp or shady deciduous lowland forests and calcareous stands. Hu, Mo, Pl, Ro, Sk.

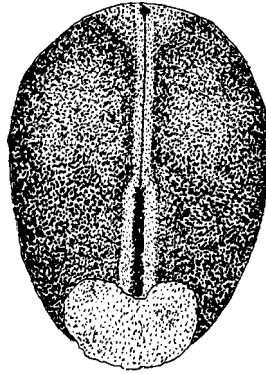
**2054. *Tithymalus epithymoides* (Jacq.) Prokh., *Euphorbia epithymoides* Jacq., *E. polychroma* A. Kerner** — Perennial, softly pubescent, stems 20-40 cm high, robust, not woody below. **Seeds slight ellipsoid, ventral side with a longitudinal furrow, dorsal side with a rib, bottom with a small aril, 2.4-2.6 x 1.9-2.1 mm. Surface with raised yellowish reticulum, lustreless, brown. 2n = 16.** Native to Europe, in somewhat calcicole stands. Br, Hu, Mo, Pl, Ro, Sk.

**2055. *Tithymalus esula* (L.) Scop., *Euphorbia esula* L., *E. pinifolia* Lam.** — Perennial, glabrous or downy, stems poorly tufted,  $\pm$  erect, 30-100 cm high, scaled below. **Seeds ovoid or ellipsoid, apex obtuse, aril subcircular, chalaza area convex, 2.4-2.8 x 1.5-1.7 mm. Surface smooth, lustrous, pale-grey or brownish, sometimes with brown spots. 2n = 60, 64.** Native to Eurasia, on meadows, pastures, ways, coastal shrubberies, fallows; throughout the Carpathians.

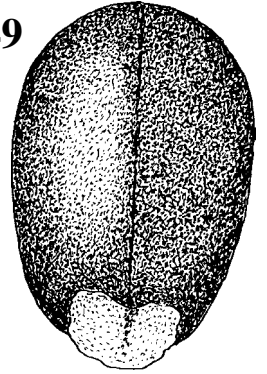
**2056. *Tithymalus exiguus* (L.) Lam., *Euphorbia exigua* L.** — Annual, glabrous, stems erect, 5-30 cm high, simple, ramified from base. **Seeds obovoid-quadrangular, apex truncate, arillate, 1.4-1.6 x 0.9-1.1 mm. Surface vermicular-rugose, dull, grey,**



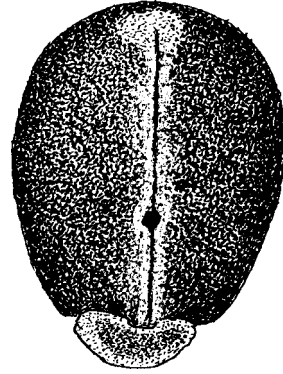
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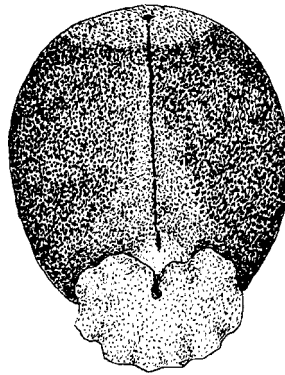
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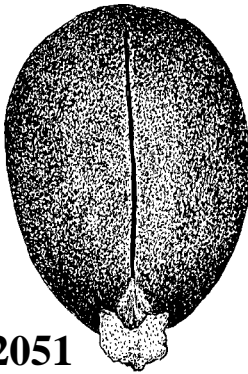
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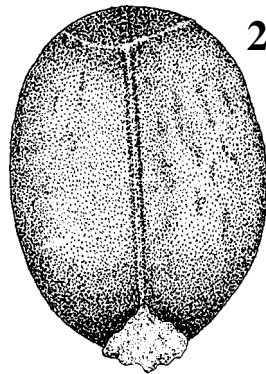
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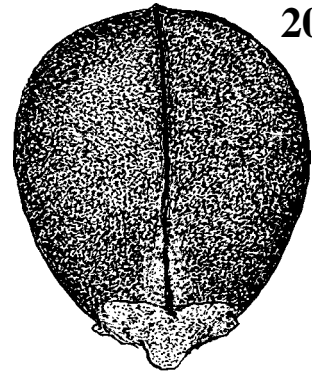
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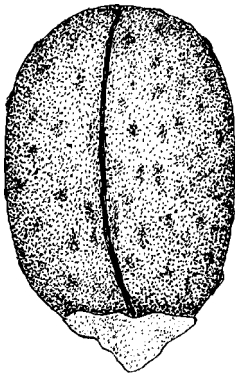
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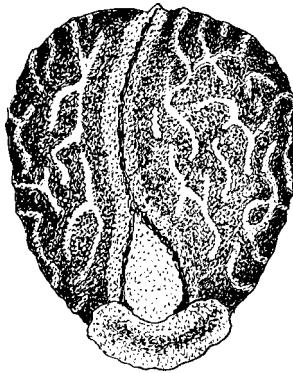
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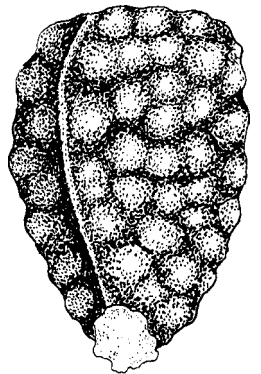
2053



2055



2054



2056

greyish-green to lilac-grey.  $2n = 16, 24$  (28, 56). Native to Europe as a field weed, in waste places, along roads, in stony and loamy soils; in lowlands and uplands of all Carpathian regions.

**2057. *Tithymalus falcatus* (L.) Klotsch et Garcke, *Euphorbia falcata* L.** – Annual, glabrous, stems simple, 5-40 cm. **Seeds obovoid-quadrangular, flat-tish, transversal striate or sulcate, arillate, 1.5-1.8 x 0.9-1.1 mm. Surface smooth, dull, pale-grey.  $2n = 16$ .** Native to the Mediterranean, dragging into the Carpathians as weed of fields, gardens, fallows, waste places; throughout the Carpathians.

**2058. *Tithymalus graeca* Boiss. et Sprun., *Euphorbia graeca* Boiss. et Sprun., *E. taurinensis* All.** – Annual, stems erect, glabrous, dispersally leafy, up to 15 cm high, simple or with 2 branches from the base. **Seeds ellipsoid, apex and bottom truncate, ventral side with a longitudinal furrow, arillate, 2-2.4 x 1.4-1.6 mm. Surface deep pitted, greyish-white, dark-grey in the pits.  $2n = 28$ .** Native to southeastern Europe, in arid rocky stands, disturbed grounds, uniquely dragging as weed into fields and vineyards.

**2059. *Tithymalus helioscopia* (L.) Scop., *Euphorbia helioscopia* L.** – Annual, stem single, 10-50 cm high, erect, rounded. **Seeds obovoid to broad obovoid, apex obtuse, arillate, 2-2.4 x 1.5-1.8 mm. Surface dull, coarse reticulate, reddish-brown.  $2n = 42$ .** Native to Euro-Siberia, weed of fields, gardens, vineyards, embankments, ditches, waste places; very common throughout the Carpathians.

**2060. *Tithymalus lathyris* (L.) Hill., *Euphorbia lathyris* L.** – Biennial (perennial), up to 1 m high, stems erect, greyish-green, branched only above. **Seeds barrel-shaped, apex truncate, arillate, 4.7-5.3 x 3.6-3.8 mm. Surface reticulate-foveolate, lustreless, pale-brown with dark-brown spots.  $2n = 20$ .** Native to the Mediterranean; often cultivated as an ornamental in gardens, impermanently naturalized in ruderal and cultivated grounds. Ro, Sk, Uk.

**2061. *Tithymalus lucidus* (Waldst. et Kit.) Klotzsch et Garcke, *Euphorbia lucida* Waldst. et Kit.** – Perennial, robust, 40-140 cm high, stems rough, with 4-6 leafy twigs above. **Seeds ellipsoid, apex obtuse, arillate, 3.2-3.4 x 2-2.2 mm. Surface smooth, lustreless or slight lustrous, pale-grey or violet-brown.  $2n = 40$ .** Native to central Europe, rare on damp meadows, riverbanks, marshes and at lowland forest edges; in all Carpathian regions.

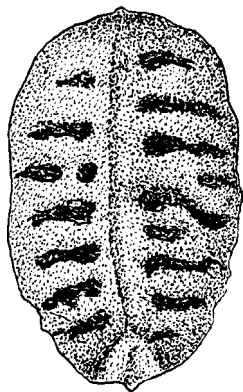
**2062. *Tithymalus maculata* (L.), *Euphorbia maculata* L., *Chamaesyce maculata* (L.) Small** – Annual, procumbent, with branches up to 20 cm high, stems pubescent, leaves ovate-oblong to oblong, serrulate near the apex. **Seeds ovoid-quadrangular, with 3-4 transverse furrows on each-side, 0.8-1 x 0.5-0.6 mm. Surface smooth, faint lustrous, greyish-brown.  $2n = 28$ .** Native to North America; in the Carpathians naturalized as a weed and ruderal. Hu, Ro.

**2063. *Tithymalus myrsinites* (L.) Hill, *Euphorbia myrsinites* L.** – Perennial, greyish-green, tufted, 20-40 cm high, stems rough, procumbent up to ascending, dense leafy. **Seeds ellipsoid, apex and base truncate, arillate, 4-4.6 x 2.1-2.4 mm. Surface vermicular-rugose or exceptional smooth, lustreless, pale-brown to dark-brown, seldom pale-grey.  $2n = 20$ .** Native to southern Europe, in rocky places, precious species for growing in rock-gardens and wall-crowns. Ro.

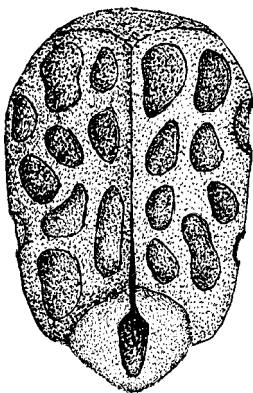
**2064. *Tithymalus nutans* (Lag.), *Euphorbia nutans* Lag., *E. preslii* Guss., *E. hypericifolia* Jan Elench.** – Annual, stems pubescent above when young, otherwise nearly glabrous, up to 60 cm high, procumbent to ascending. **Seeds ovoid-quadrangular, irregular transversal rugose, apex truncate, bottom narrowed, 1-1.2 x 0.5-0.6 mm. Surface lustreless, grey.** Originally growing in North America, dragging into the Carpathians, on disturbed grounds, locally naturalized. Hu, Ro.

**2065. *Tithymalus palustris* (L.) Hill., *Euphorbia palustris* L.** – Perennial, robust, tufted, glabrous, stems erect, 50-150 cm high, greyish-green. **Seeds ellipsoid or broad ellipsoid to obovoid, apex obtuse, arillate, 3.2-3.7 x 2.6-3 mm. Surface smooth, lustrous, grey nut to olive-brown.  $2n = 20$ .** Native to Europe, at margins of stagnant and flowing waters, wet meadows, reed beds, lowland forests, coastal shrubberies; throughout the Carpathians.

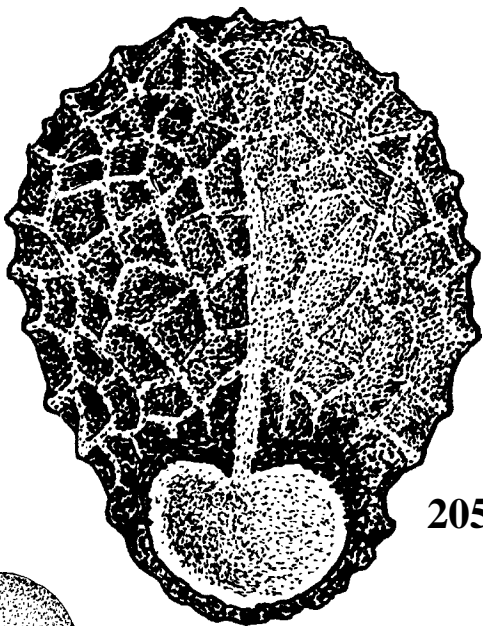
**2066. *Tithymalus pannonicus* (Host) Á. et D. Löve, *Euphorbia stepossa* Zoz. ex Prokh., *E. nicaeensis* Barth.** – Perennial, tufted, glabrous, stems erect, 20-60 cm, woody at base. **Seeds obovoid to ellipsoid, arillate, 2.4-2.7 x 1.3-1.5 mm. Surface smooth, lustreless, greyish, faint spotted brown.** Native to Europe (Pannonia, Balkan Peninsula) in sunny, grassy places, roadsides, stony slopes, with dry, basic, sandy and loamy soils. Hu, Mo, Ro, Sk, Uk.



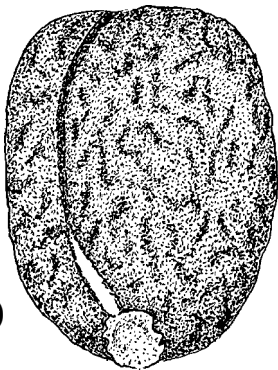
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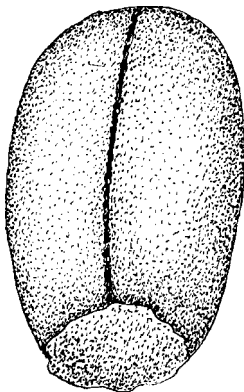
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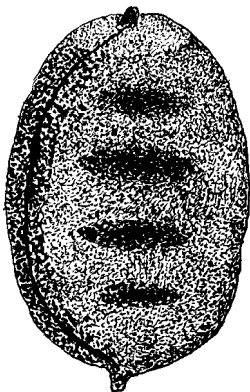
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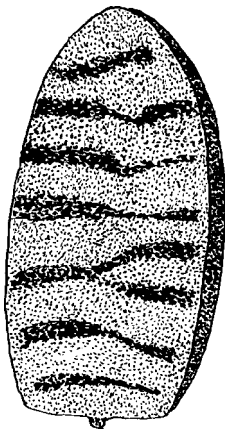
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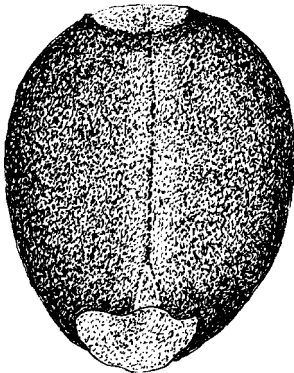
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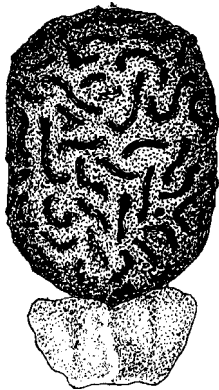
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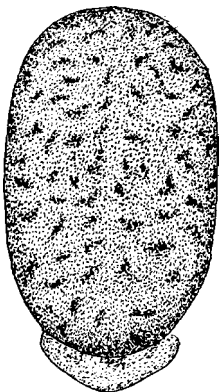
2064



2065



2063



2066

**2067. *Tithymalus paralias* (L.), *Euphorbia paralias* L.** — Perennial, a robust plant, up to 70 cm high, with numerous erect branches from the base. **Seeds broad ovoid, apex narrowed, base truncate, without aril, 2.8-3.2 x 2.2-2.5 mm. Surface smooth, lustreless, pale-greyish, irregularly spotted brown. 2n = 16.** Native to sandy sea-shores of southern and western Europe; occasionally hauling into the Carpathians with seed-corn. Ro, Uk.

**2068. *Tithymalus peplis* (L.), *Euphorbia peplis* L.** — Annual, stems 2-3 cm, prostrate, dichotomically branched, together with leaves glabrous, somewhat fleshy. **Seeds obovoid-pyriform, dorsal side convex, ventral flat, with a longitudinal furrow, 2.6-2.8 x 1.9-2.1 mm. Surface smooth, lustreless, pale-grey, occasional brown-mottled.** Native to sea-shores of southern and eastern Europe, eastern Asia, northern Africa, in sandy littoral, saline stands, rare in inland areas. Ro, Uk.

**2069. *Tithymalus peplus* (L.) Gaertn., *Euphorbia peplus* L.** — Annual, bare, stems 5-40 cm, poorly branched at base, rounded. **Seeds prolonged ellipsoid or ovoid, hexagonal, sulcate ventral (two rows) and pitted dorsal (four rows), 1.4-1.8 x 0.8-1 mm. Surface smooth, dull, pale-grey, pits dark-grey. 2n = 16.** Native to most of Europe; in the Carpathians very abundant in cultivated or waste grounds, as a weed in gardens, fallows, fields and roadside verges. Hu, Mo, Pl, Ro, Sk, Uk.

**2070. *Tithymalus platyphyllos* (L.) Raf., *Euphorbia platyphyllos* L.** — Annual, glabrous or downy, stems erect, 20-100 cm, with numerous axillary stems. **Seeds ellipsoid, slight flattish, dorsal side slight convex, ventral biangular, arillate, 1.8-2.2 x 1.4-1.6 mm. Surface smooth, high lustrous, olive-brown. 2n = 28, 30.** Native to the Mediterranean and the Orient, on sunny, shrubby slopes, dry meadows, boundaries, in fields and gardens. Hu, Mo, Pl, Ro, Sk, Uk.

**2071. *Tithymalus polychromus* (A. Kern.) Prokh., *Euphorbia polychroma* A. Kern.** — Perennial, fine and dense downy, stems erect, 20-50 cm high, ramified and reddish-scaled at the base. **Seeds globular-obovate, slight flattish, arillate, 2.5-3 x 1.9-2.3 mm. Surface with a raised reticulum, lustreless, brown or yellowish-grey.** Native to Europe, on steppes, bushy and stony slopes, edges of light and dry forests, somewhat calcicole; often cultivated in gardens as ornamental. Hu, Mo, Pl, Ro, Sk, Uk.

**2072. *Tithymalus salicifolius* (Host) Klotzsch et Garcke, *Euphorbia salicifolia* Host.** — Perennial, glandular-pubescent, stems erect, 30-80 cm high, dense leafy, unramified. **Seeds ellipsoid to ovoid, apex obtuse, arillate, 1.1-2.1 x 1.3-1.5 mm. Surface smooth, slight shiny, grey to dark-brown. 2n = 36.** Native to Eurasia, on roadsides, in dry lowland meadows, waste places, forest steppes and clearings. Br, Hu, Mo, Ro, Sk, Uk.

**2073. *Tithymalus segetalis* (L.) Lam., *Euphorbia tetraceras* Lange** — Annual (perennial), glabrous, 10-35 cm, stems erect, simple or ramified at base. **Seeds oval, arillate, 2.5-2.9 x 1.5-1.7 mm. Surface rough irregular reticulate, shallow pitted, pale grey or pale-brown. 2n = 16.** Native to the Mediterranean, on calcareous soils rich in nutrients; in the Carpathians locally naturalized as a weed in fields, gardens and waste places. Hu, Ro.

**2074. *Tithymalus sequierianus* (Necker) Prokh., *T. gerardianus* Jacq.** — Perennial, stems up to 60 cm high, erect or ascending, glabrous. **Seeds oblong-ellipsoid, convex-convex, with a dark-brown furrow on ventral side, 1.7-2 x 0.9-1 mm. Surface glabrous, lustreless, pale-brown, with dark-brown spots, or pale-grey. 2n = 16.** Native to Eurasia, on sunny, scrubby steppe slopes, sand banks, boundaries, in lowlands and uplands. Hu, Mo, Pl, Ro, Sk, Uk.

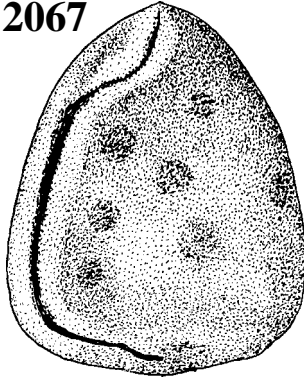
**2075. *Tithymalus strictus* Klotzsch et Garcke, *Euphorbia serrulata* Thuill.** — Annual, bare, more tender and smaller than *T. platyphyllos*, glabrous. **Seeds ellipsoid to obovoid, slight flattish, arillate, 1.4-1.8 x 1-1.2 mm. Surface smooth, high lustrous, reddish-brown. 2n = 14, 28.** Native to Europe, on moist to muddy pastures, brook and riverbanks, trenches. Hu, Mo, Pl, Sk, Uk.

**2076. *Tithymalus taurinensis* (All.) Klotzsch et Garcke, *Euphorbia taurinensis* All.** — Annual, stems erect, simple or poorly branched at the base, 30-40 cm high, leaves alternative, linearly lanceolate. **Seeds ellipsoid, apex ± truncate, bottom arillate, 1.8-2.2 x 1.3-1.5 mm. Surface reticulate, dull, brown. 2n = 28.** Native to the Mediterranean; uniquely hauling into the Carpathians to disturbed grounds, desolate vineyards, fields, along railways. Hu, Ro, Sk.

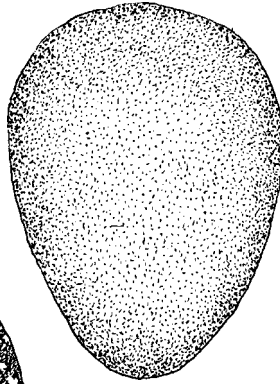
**2077. *Tithymalus tommasianus* (Bertol) Soják, *T. waldsteinii* Soják, *Euphorbia tommasiana* Bertol, *E. virgata* Waldst. et Kit. non Desf.** — Perennial,



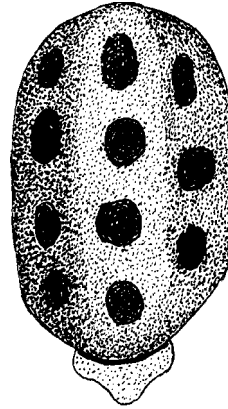
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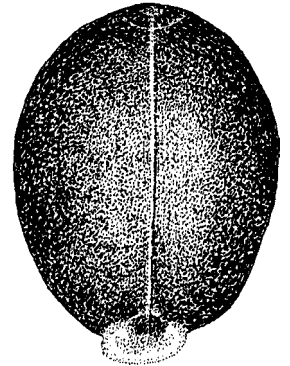
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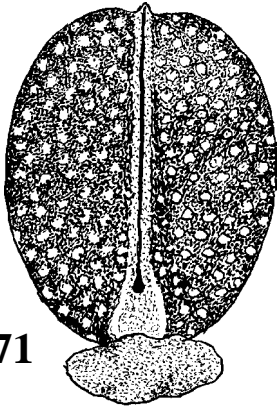
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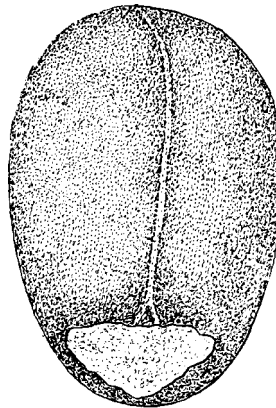
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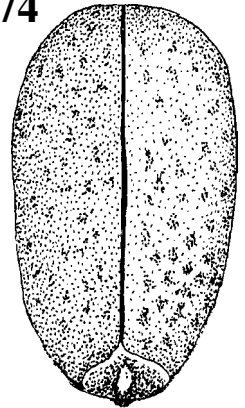
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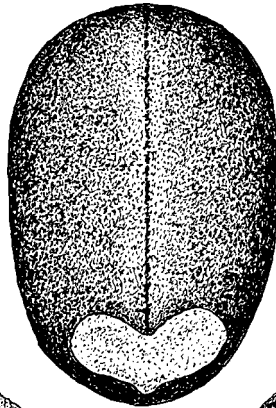
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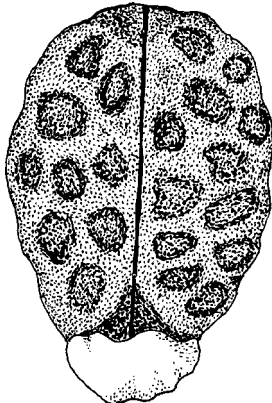
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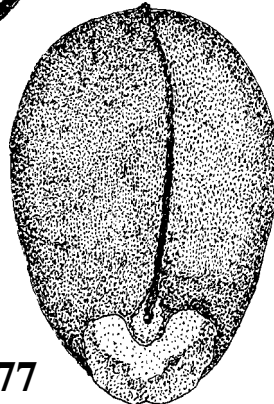
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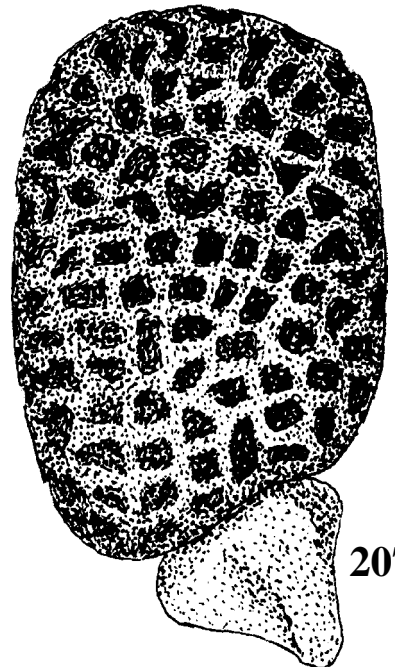
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2073



stems erect, thin, 30-120 cm high, with numerous twigs. **Seeds obovoid, apex obtuse, aril subcircular, 2.1-2.4 x 1.4-1.6 mm. Surface smooth, slight lustrous, unicolour grey or spotted brown. 2n = 20.** Native to Eurasia, on sunny shrubby slopes, boundaries, vineyards, waste places. Hu, Mo, Pl, Sk, Uk.

**2078. *Tithymalus villosus*** (Waldst. et Kit.) Pascher, *Euphorbia procera* M. Bieb. — Perennial, tufted, downy or bare, stems numerous, often with non-flowering branches, erect, 50-120 cm high. **Seeds obovoid to globose, arillate, 2-2.8 x 1.9-2.3 mm. Surface smooth or low tuberculate, lustrous, dark-brown. 2n = 20.** Native to Europe, on moist meadows, coastal thickets, moist forest clearings. Hu, Mo, Pl, Ro, Sk, Uk.

**2079. *Agaloma marginata*** (Pursh) Á. et D. Löve, *Euphorbia marginata* Pursh, *E. variegata* Sims — Annual, up to 50 cm high, greyish-green, stems erect, richly ramified on knots fragile. **Seeds obovoid, without aril, 3.6-4 x 3.1-3.3 mm. Surface pointed or stripped humpy, pale- or straw-brown. 2n = 56.** Native to North America; in the Carpathians often cultivated in gardens as an ornamental summer-plant, impermanently escaping. Sk.

**2080. *Ricinus communis*** L. — Annual, robust, up to 2 m high, stems erect, reddish, glabrous. **Seeds ellipsoid, dorsal side rounded, ventral side flat, with longitudinal suture, arillate at base, 12-20 x 8-12 mm. Surface smooth, lustrous, basic colour dark-red or reddish-brown, with prolonged spots, marble-spotted. 2n = 40.** Originally growing in tropical Africa, often cultivated in gardens for the oil from seeds and as an ornamental plant; naturalized in the Carpathians. Hu, Mo, Ro, Sk, Uk.

## 91. BUXACEAE

**2081. *Pachysandra terminalis*** Siebold et Zucc. — Semishrub up to 25 cm high, procumbent or ascending, glabrous. **Seeds obovoid, dorsal side rounded, ventral side slight flat, 4.7-5.3 x 3.3-3.7 mm. Surface smooth, glossy, dark-brown.** Native to North America; in the Carpathians very rarely cultivated in parks as an ornamental.

**2082. *Buxus sempervirens*** L. — Evergreen shrub or a small tree, 2-5 m high, mostly glabrous, twigs 4-angular, young twigs whitish downy. **Seeds prolonged ovoid, triangular in transversal section, with a small caruncle at the base, 5-5.6 x**

**2.3-2.6 mm. Surface smooth, glossy, black. 2n = 18.** Native to Euro-Siberia, in light lowland forests, shrubby slopes, usually on dry, base-rich soils; several cvs are grown in gardens, a dwarf cv. is usually used for edging flower-beds. Hu, Mo, Pl, Ro, Sk, Uk.

## 92. ELAEAGNACEAE

**2083. *Elaeagnus angustifolia*** L. — Shrub or small lay-out tree, up to 8 m high, twigs prickly. **Seeds prolonged ovoid or cylindric with dark-brown and pale-brown stripes, 11-13 x 5-6 mm. Surface smooth, dull. 2n = 28.** Native to southeastern Europe as far as to the Himalayas; in the Carpathians planted for ornament in parks, gardens and town verdure, widely naturalized. Hu, Mo, Pl, Ro, Sk, Uk.

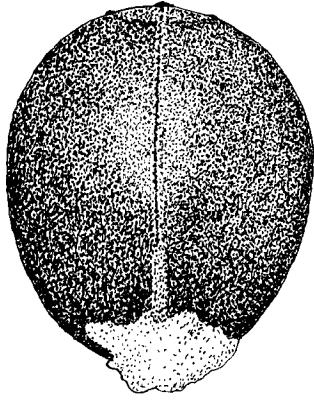
**2084. *Elaeagnus commutata*** Bernh. ex Rydb., *E. argentea* Pursh non Moench — Shrub, trunks 1-4 m high, twigs without prickles, reddish-brown. **Seeds prolonged ellipsoid, constricted towards both ends, 8-12 x 4.7-5.3 mm. Surface covered with alternate dark-brown and yellowish-brown stripes, lustreless. 2n = 28.** Native to North America; cultivated in parks and gardens, especially for reinforcement of sandy soils.

**2085. *Elaeagnus multiflora*** Thunb., *E. longipes* A. Grey, *E. edulis* Carrière — Shrub up to 3 m high. **Seeds ellipsoid, constricted towards both ends, with 8 distinct ribs, 10-12 x 3.6-4.4 mm. Surface lustreless, dull, brown, ribs pale-brown.** Native to China and Japan; in the Carpathians rarely cultivated for ornament and its edible fruits.

**2086. *Elaeagnus pungens*** Thunb. — Shrub, evergreen, up to 4 m high, twigs thorny, covered with brown hairs. **Seeds oblong ellipsoid, apex rounded, bottom gradually narrowed, 14-16 x 4.5-5.5 mm. Surface longitudinal deep ribbed and furrowed, lustreless, furrow pale-brown, ribs darker-brown. 2n = 28.** Native to Japan; in the Carpathians rarely cultivated in parks as an ornamental.

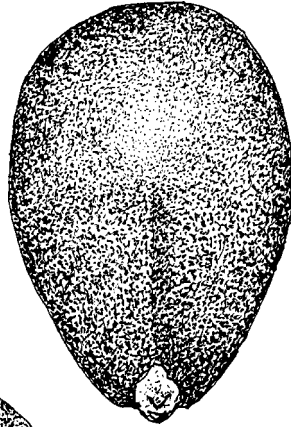
**2087. *Elaeagnus umbellata*** Thunb., *E. crispa* Thunb. — Shrub up to 4 m high. **Seeds ellipsoid, constricted to both ends, with 8 distinct ribs, 5.4-6 x 2.4-2.8 mm. Surface smooth, dull, brown or black, ribs pale-brown.** Native to China, Korea and Japan; in the Carpathians rarely cultivated in parks as an ornamental.

**2088. *Hippophaë rhamnoides*** L. — Shrub, dense ramified, 2-10 m, twigs lay-out, prickly. **Seeds**

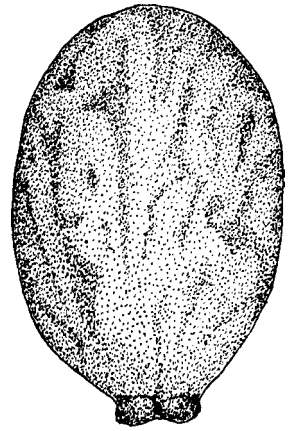


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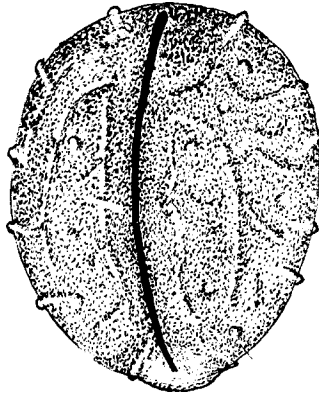
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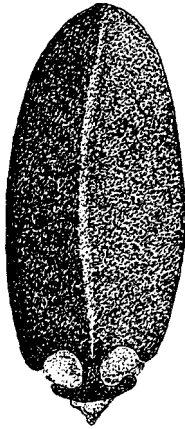
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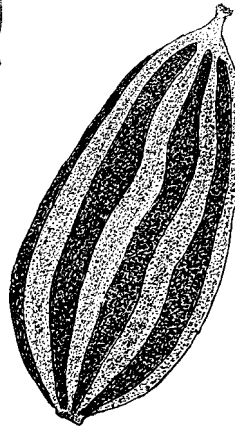
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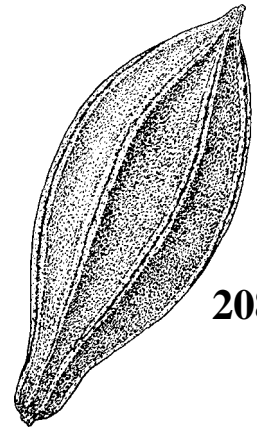
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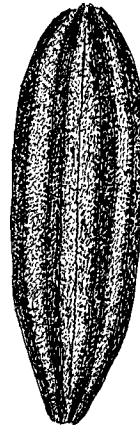
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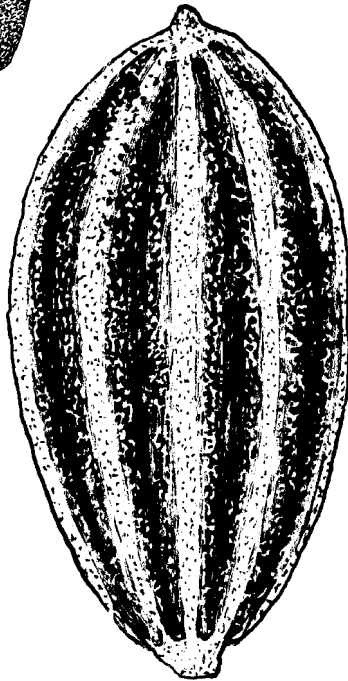
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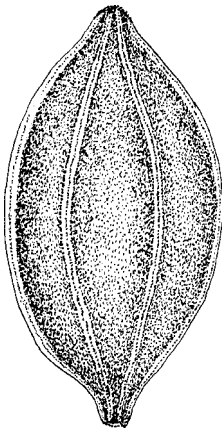
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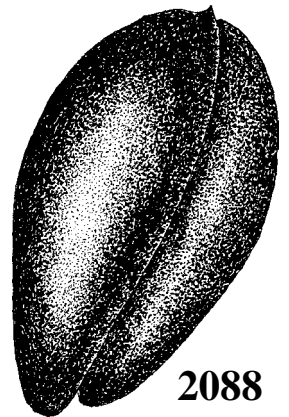
2084



2087



2088



obovoid, lateral flattish, compound with two lobes of different length, 4.4-5 x 2.5-3 mm. Surface glabrous, glossy, faint areolate, black-brown to black.  $2n = 24$ . Native to Eurasia as far as to the Himalayas, common on dunes and sea-cliffs, and on river-gravel and alluvium in montane zone; often cultivated in parks and town green throughout the Carpathians.

**2089. *Shepherdia argentea*** (Pursh) Nutt. — Shrub or tree, up to 6 m high with silvery twigs, often thorny. Seeds obovoid, lateral flattish, compound with two lobes of different length, hilum indistinct, 3.7-4.3 x 2.4-2.6 mm. Surface faint wrinkly, glossy, pale-brown. Native to North America; on sandy soils; in the Carpathians rarely cultivated in parks.

### 93. THYMELAEACEAE

**2090. *Daphne alpina*** L. — Evergreen dwarf shrub, branches decumbent, often tortuous, young twigs hairy, drupes red, pubescent. Stones obovoid, with much narrowed lower part, transversal section roundish, with longitudinal furrow on ventral side, 4.1-4.5 x 2.5-2.8 mm. Surface glabrous, lustrous, dark blackish-brown. Native to the mountains of southern Europe, usually on calcicole stands; in the Carpathians rarely cultivated in rock-gardens as an ornamental.

**2091. *Daphne arbuscula*** Čelak., *D. abietina* (Borbás) Borbás, *Rozalia arbuscula* (Čelak.) V. A. Richt. — Shrub, evergreen, 10-50 cm high, twigs  $\pm$  erect, forkedly ramified, glabrous or hirsute, reddish. Stones obovoid, apex rounded, black-spotted, with longitudinal rib on ventral side, 3.5-3.9 x 1.6-1.9 mm. Surface faint reticulate-areolate, slight lustrous, greyish-brown.  $2n = 18$ . Important plant, endemic to area of the Carpathians, on rocky carbonate terraces, at altitude 900-1250 m; scarce species for rock-gardens. Sk.

**2092. *Daphne laureola*** L. — Evergreen, tufted, shrub up to 1 m high. Stones prolonged obovoid, apex rounded, base strong constricted with hilum, 5.7-6.3 x 3-3.4 mm. Surface glabrous, faint reticulate, pale- to dark-brown or black. Native to southern Europe and western Asia, in deciduous mountain woods, mostly calcareous soils; seldom cultivated in rock-gardens and parks. Hu, Ro, Uk.

**2093. *Daphne mezereum*** L. — Shrub, 50-150 cm, twigs ascendent or erect, greyish-brown, stubborn,

hairy in young stage. Stones broad obovoid, apex obtuse to slight truncate, base  $\pm$  acute, hilum basal, inconspicuous, raphe distinct, exarillate, 5.3-5.8 x 4.8-5.1 mm. Surface glabrous, fine reticulate-areolate, orange-brown.  $2n = 18$ . Native to Eurasia, in forests to subalpine zones; somewhat calcicole; in all Carpathian territories.

**2094. *Daphne pontica*** L. — Evergreen shrub with suberect branches and spreading habit. Stones ovoid, ventral side with a longitudinal, broader belt or rib, apex acuminate, bottom rounded, 4.6-5.3 x 2.8-3.2 mm. Surface lustrous, dull, pale-brown. Native to Europe (Bulgaria, Turkey); in the Carpathians rarely planted as ornamental in rock-gardens.

**2095. *Thymelaea passerina*** (L.) Coss. et Germ., *T. arvensis* Lam. — Annual, yellow-green, 10-40 cm high, glabrous, stems erect. Fruits achenes, prolonged ovate to pyriform, apex obtuse with a small beak, base constricted, 2.3-2.6 x 1.2-1.4 mm. Surface dull, pubescent, furrowed, greyish-brown.  $2n = 18$ . Native to Eurasia, on stony, calcareous slopes, moist sands, in saline places of meadows and fields; throughout the Carpathians.

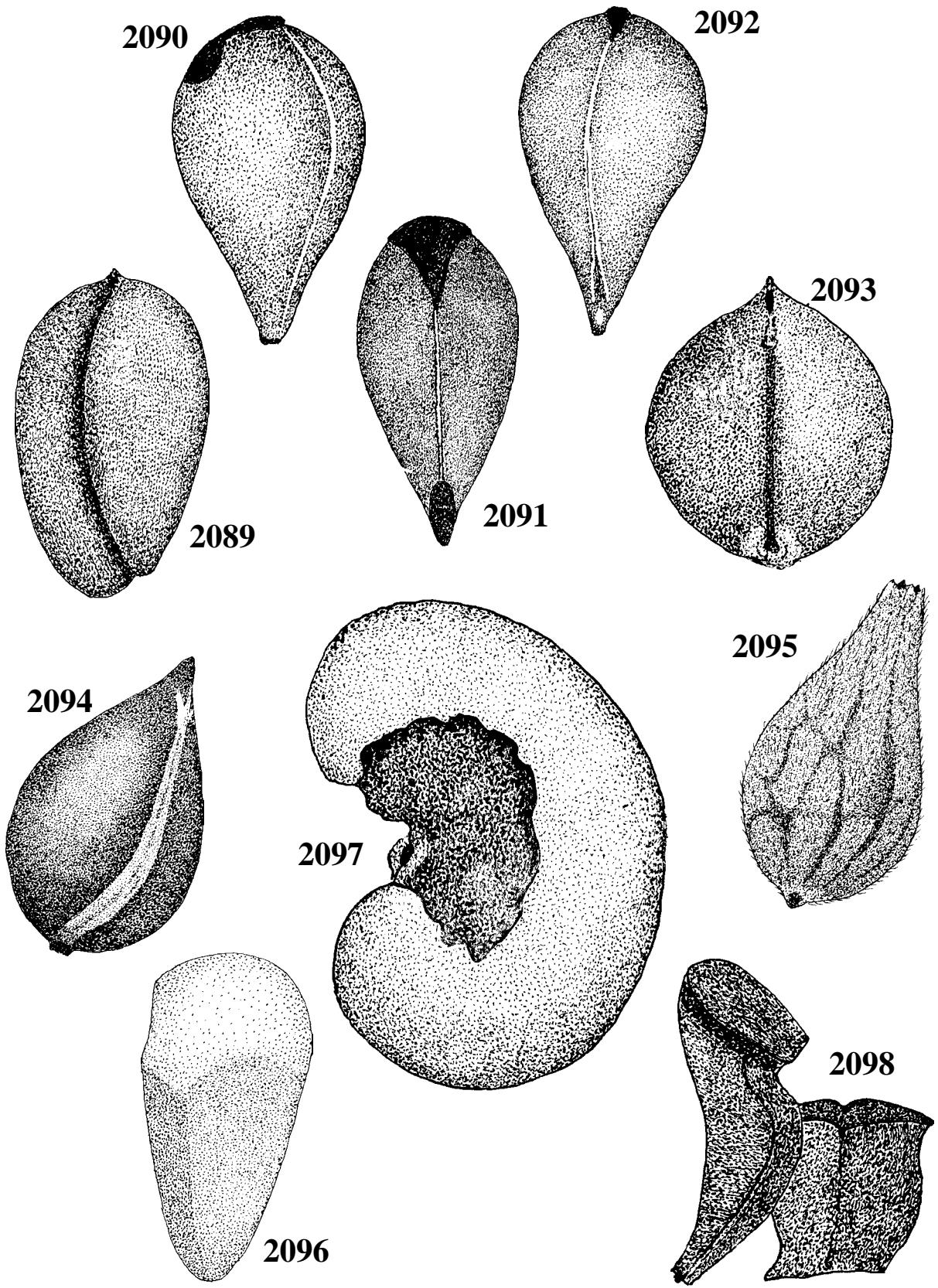
### 94. PUNICACEAE

**2096. *Punica granatum*** L. — Shrub — tree, 1-5 up to 10 m high, ramified, branches opposite, glabrous, sometimes spiny. Seeds embedded in a pulp, prolonged obovoid, angular, ventral side with a broad, often ramified furrow, 5.8-6.4 x 2.8-3.2 mm. Surface smooth or faint foveolate, pale yellowish-white. Originally growing in Asia Minor or (and) northern Africa, on dry warmer and stony slopes, in splits up to 500 m, cultivated for its fruits. Hu, Mo, Ro, Uk.

### 95. MYRTACEAE

**2097. *Myrtus communis*** L. — Shrub, dense ramified, twigs in young stage glandular-hairy. Seeds reniform curved with hard testa, 3.3-3.7 x 2.4-2.7 mm. Surface of the testa glossy, pale-yellow, central part greyish, fine reticulate-areolate.  $2n = 22$ . Native to southwestern Europe and the Mediterranean, in scrubs, usually calcifuge, rocky slopes, sand dunes, in areas with mild winters; in the Carpathians rarely cultivated in gardens and flowerpots.

**2098. *Eucalyptus globulus*** Labill. — Tree, up to 40 m high, bark smooth, deciduous, leaves ovate to broadly



lanceolate, cordate, very glaucous when juvenile, mature leaves lanceolate, acuminate, glossy-green, flowers solitary. **Seeds very irregular shaped of two types, longer 2.5-3 x 0.5-0.9 mm, shorter 1.3-1.5 x 1.4-1.6 mm. Surface longitudinal fine striate, slight lustrous, purplish.** Native to Tasmania; in the Carpathians very rarely cultivated in flowerpots as an ornamental shrubs.

**2099. *Eucalyptus viminalis*** Labill. — Tree, up to 50 m high, bark smooth, white, deciduous, often hanging, twigs often hanging from the branches in long ribbons. **Seeds of irregular shape, prolonged, lateral compressed, radicle shorter than the cotyledons, 0.8-1.4 x 0.4-0.5 mm. Surface dense granulate, glittery, dark-brown.** Native to Australia (Tasmania); in the north Carpathians once experimentally planted as a forest tree, in Romania cultivated for its etheric oil.

## 96. LYTHRACEAE

**2100. *Middendorfia borysthenica*** (Schrank) Trautv., *Lythrum borysthenicum* (Schrank) Litv. — Annual, usually  $\pm$  scabrid-hispid at least above, stems 5-25 cm high, usually erect or creeping rooting at the base. **Seeds obovoid, concavo- or planoconvex, 0.5-0.6 x 0.35-0.45 mm. Surface on the dorsal side shallow furrowed, scarce whitish hairy, lustreless, brown. 2n = 30.** Native to southern Europe, on overflowed meadows, river valleys with sandy soils; extending northwards into the Carpathians. Uk.

**2101. *Lythrum hyssopifolia*** L. — Annual, glabrous, pale-green, 5-50 cm high, stems ascendent or erect, branched only underneath, wingly angular. **Seeds broad obovoid, slight dorsoventral flattish, 0.8-1 x 0.6-0.7 mm. Surface reticulate-areolate, hilum usually dark, orange-brown. 2n = 20.** Native to Eurasia, on dunes, river banks, in damp places and seasonally flooded grounds; in all Carpathian territories.

**2102. *Lythrum salicaria*** L. — Perennial, stems erect, 50-150 cm high, glabrous or grey hairy, sharply up to wingly 4-angular, simple or ramified on the bottom part. **Seeds narrowly obovoid, dorsal side convex, ventral side flat, hilum inconspicuous, 0.9-1.1 x 0.4-0.5 mm. Surface reticulate-areolate, orange-brown. 2n = 30.** Native to Eurasian banks of stagnant or flowing waters, ditches, wet meadows, moorlands, reed beds, fens; throughout the Carpathians.

**2103. *Lythrum tribacteatum*** Salzm. ex Spreng., *L. dibacteatum* Guss., *L. salzmanii* Jord. — Annual, glabrous or rough, downy, stems erect or procumbent, 5-30 cm high, 4-angular, richly branched. **Seeds spheroid, both ends constricted, hilum inconspicuous, 0.5-0.6 x 0.4-0.5 mm. Surface hirsute, dull or slight lustrous, yellowish brown. 2n = 12.** Native to Eurasia, in seasonally wet places. Hu, Mo, Ro, Sk, Uk.

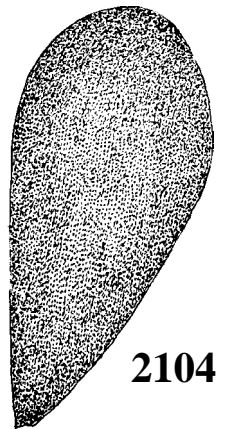
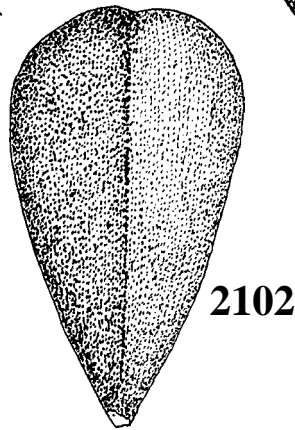
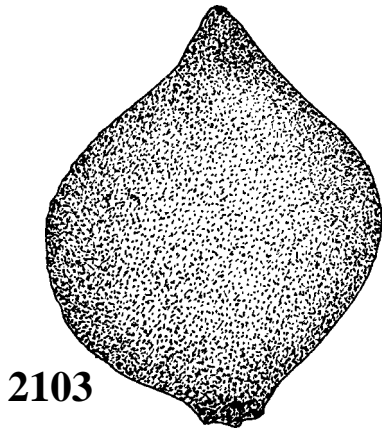
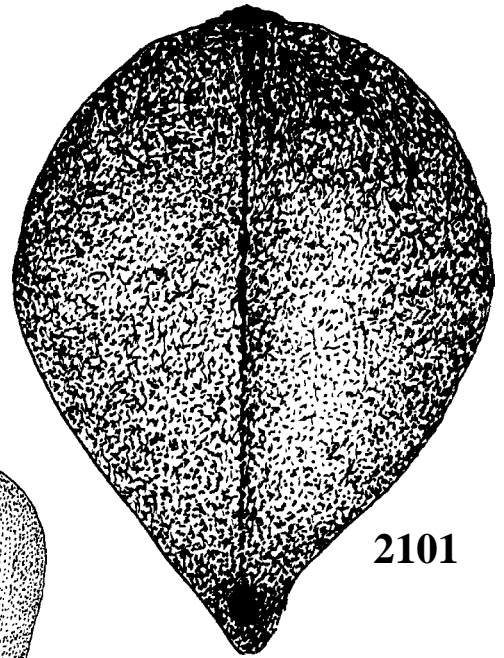
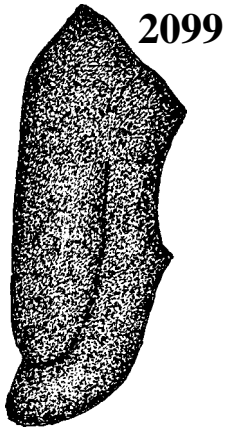
**2104. *Lythrum virgatum*** L. — Perennial, slender, bare, stems erect, 30-100 cm high, 4-angular, branched above. **Seeds narrow obovoid, ventral side flat, dorsal side convex, hilum inconspicuous, 0.9-1.1 x 0.4-0.5 mm. Surface reticulate-areolate, reddish-brown. 2n = 30.** Native to Eurasian marshes and other wet places; sometimes cultivated for ornament and locally naturalized; throughout the Carpathians.

**2105. *Peplis portula*** L., *Lythrum portula* (L.) D. A. Webb — Annual, bare, stems procumbent up to 25 cm high, branched, on knots rooting down, twigs erect, 4-angular, up to 10 cm high. **Seeds obovoid to cordate, dorsal side convex, ventral side flat or slight concave, base constricted with conical hilum, c. 0.6 x 0.5 mm. Surface smooth, lustrous, pale yellowish-brown. 2n = 10.** Native to European stripped riverbanks, damp fallows and sandbanks; in all Carpathian territories.

## 97. ONAGRACEAE

**2106. *Chamaerion angustifolium*** (L.) Holub, *Epilobium angustifolium* L. — Perennial, stems erect, 100-200 cm, rounded, branchless. **Cypselas cuneiform, slight flattish, dorsal side convex, ventral side flat, upper part with a short hem and a whitish-pink pappus, 1.1-1.3 x 0.3-0.4 mm. Surface longitudinal furrowed, dull, pale-brown. 2n = 36.** Native to Eurasia and North America, in woodlands, clearings, forest edges, soils rich in nitrogen; almost throughout the whole Carpathians.

**2107. *Chamaerion dodonaei*** (Vill.) Holub, *Epilobium dodonaei* Vill. — Semishrub, stems erect, 20-100 cm high, woody, downy at base, with short leafy twigs. **Cypselas prolonged obovoid, dorsal side convex, ventral side slight flat, with a short hem and a whitish pappus on upper part, 1.8-2.2 x 0.6-0.8 mm. Surface shallow and short furrowed, reticulate-papillose, dull, pale-brown. 2n = 36.** Native to central and southern Europe, in forests, stony or sandy places. Hu, Mo, Pl, Ro, Sk, Uk.

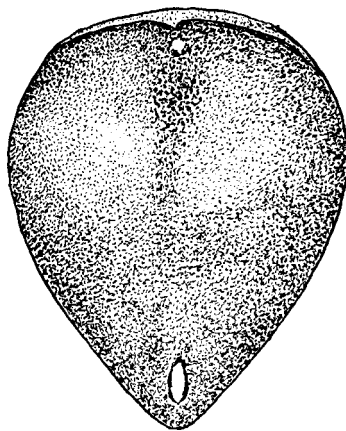


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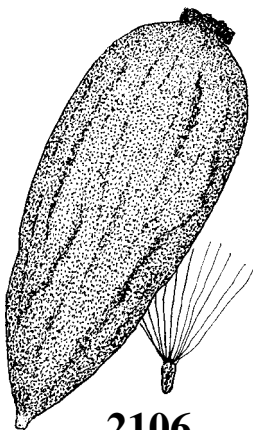
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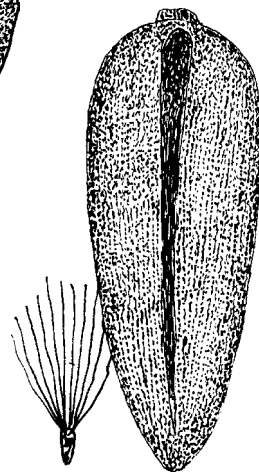
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**2108. *Chamaerion fleischeri*** (Hochst.) Holub, *Epilobium fleischeri* Hochst. — Perennial, stems 20-40 cm high, procumbent, ascending. **Cypselas cuneiform, bottom gradually narrowed, biconvex, longitudinal furrow on ventral side distinct, whitish pappus on upper part, 1.3-1.6 x 0.4-0.6 mm. Surface ribs with low papillae, faint lustrous, pale-brown. 2n = 26.** Native to the Alps; rarely hauling into the Carpathians.

**2109. *Epilobium alpestre*** (Jacq.) Krock., *E. trigonum* Schrank — Perennial, stems rough, erect, 20-70 cm high, branched on upper 1/3, brownly scaled, rounded below. **Cypselas prolonged obovate, planoconvex, constricted at base, apex obtuse, neck distinct, apical hairs c. 5 mm long, 1.6-1.8 x 0.6-0.8 mm. 2n = 36.** Native to the mountains of central and southern Europe, on moist meadows, along springs and brooks in subalpine zone. Pl, Ro, Sk, Uk.

**2110. *Epilobium alsinifolium*** Vill., *E. alpinum* auct. non L. — Perennial, glabrous, glossy green, stems ascendent or erect, 5-25 cm high, simple, with 2 or 4 rails of hairs. **Cypselas narrow obovoid, planoconvex, apex with a distinct neck, apical hairs 7-10 mm long, 1.4-1.6 x 0.4-0.5 mm. Surface reticulate, lustreless, nut-brown. 2n = 36.** Native to Europe, in mountains, near springs, in damp meadows, muddy soils, at margins of mountain rivers of the subalpine zone. Pl, Ro, Sk, Uk.

**2111. *Epilobium anagallidifolium*** Lam. — Perennial, stem tufted, ascendent, 2-10 cm, unbranched, glabrous. **Cypselas narrow obovoid, planoconvex, apex with a distinct neck, apical hairs 3-4 mm long, with pellucid appendage, 0.9-1.2 x 0.3-0.5 mm. Surface reticulate, orange-brown, smooth. 2n = 36.** Native to Europe, near springs, damp screes, snow deck-chairs, rock crevices. Pl, Ro, Sk, Uk.

**2112. *Epilobium ciliatum*** Raf., *E. adenocaulon* Hausskn. — Perennial, stems erect or ascendent, 30-150 cm high, with 2 or 4 longitudinal hirsute rails. **Cypselas narrow obovoid, planoconvex, apex with a distinct neck, apical hairs 6-9 mm long, 0.8-1 x 0.3-0.4 mm. Surface markedly ribbed, flat tubercles in longitudinal rows connate, brown. 2n = 18, 36.** Native to North America, today commonly growing in Europe on stripped pond bottoms, woodland clearings and margins, boundaries, in waste places at altitudes up to 1000 m; naturalized as a weed and ruderal in a large part of the Carpathians. Mo, Pl, Sk, Uk.

**2113. *Epilobium collinum*** C. C. Gmel., *E. montanum* subsp. *collinum* (C. C. Gmel.) Čelak. — Perennial, strigose, stems ascendent or erect, 10-40 cm high, branched from base, without glands. **Cypselas obovoid, planoconvex, apex obtuse, neck missing, apical hairs 5.5-7.5 mm long, 0.9-1.1 x 0.4-0.5 mm. Surface dense tuberculate, greyish-brown. 2n = 36.** Native to European sunny, stony, rocky and shrubby slopes, forest margins, clearings, stone-pits, from lowland to montane zones; throughout the Carpathians.

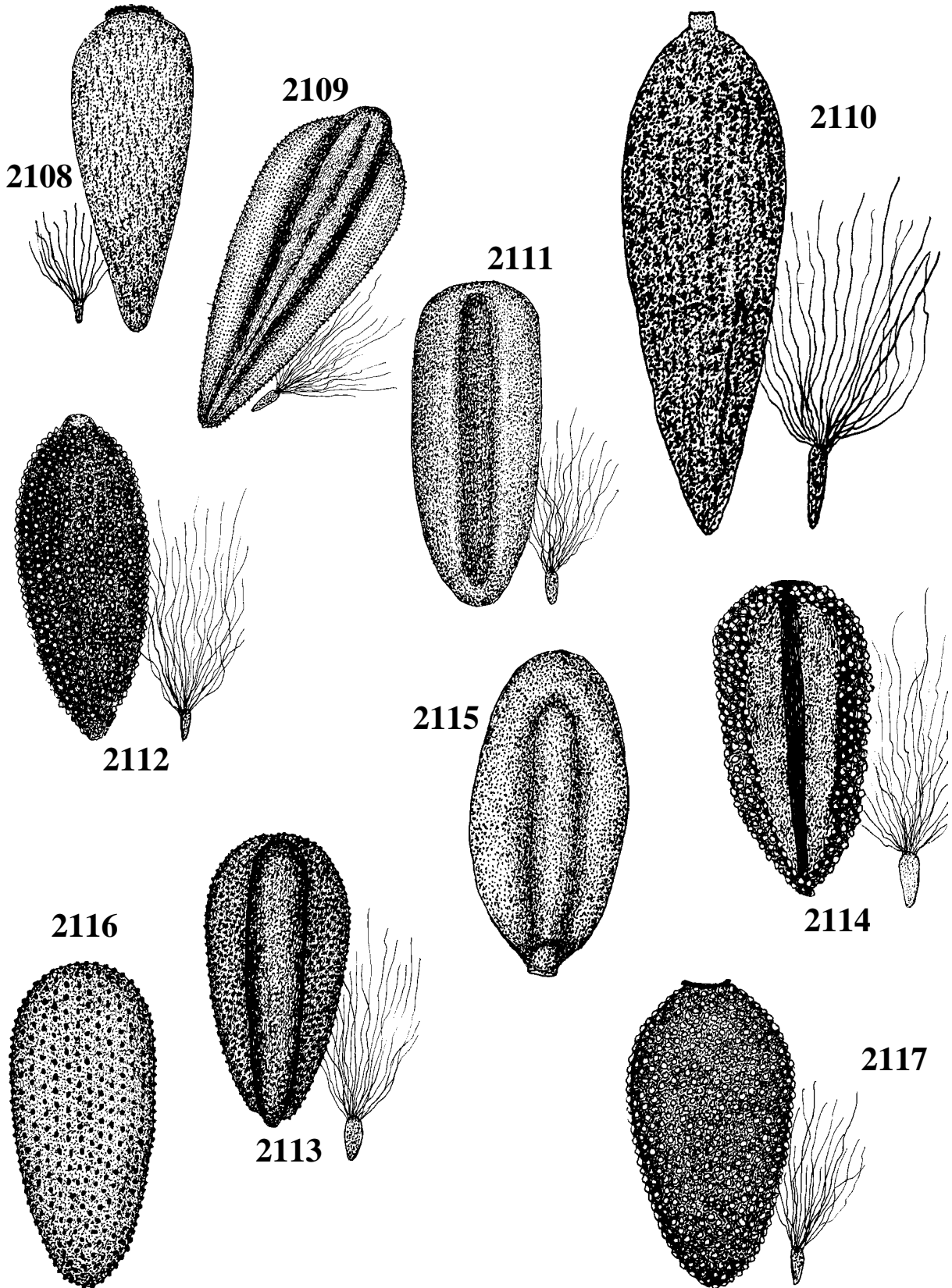
**2114. *Epilobium hirsutum*** L. — Perennial, stems stiffly erect, 100-200 cm high,  $\pm$  branched,  $\pm$  angular below, rounded, glandularly shaggy above. **Cypselas obovoid, planoconvex, apex obtuse, neck missing, apical hairs 8-12 mm long, 0.9-1.1 x 0.4-0.6 mm. Surface fine tuberculate, dull, reddish-brown. 2n = 36.** Native to Eurasia, in coastal thickets, lowland and humous forests, moist clearings, stream banks; in all Carpathian territories.

**2115. *Epilobium komarovianum*** Léveillé, *E. nert-eroides* auct., *E. hectori* hort. — Perennial, tiny, dense tufted, stems decumbent, rooting down at knots. **Cypselas oblong ellipsoid, planoconvex, with three longitudinal ribs and two furrows at ventral side, 0.6-1 x 0.2-0.4 mm. Surface fine reticulate, smooth, pale-brown.** Native to New Zealand; in the Carpathians rarely cultivated in rock-gardens. Sk.

**2116. *Epilobium lamyi*** F. W. Schultz — Perennial, stems erect, up to 30-100 cm high, branched below, simple above, hirsute. **Cypselas prolonged obovoid, dorsal side convex, ventral side deep and broad furrowed, 1-1.2 x 0.4-0.5 mm. Surface in longitudinal rows pustulate, papillae hyaline, lustreless, brown. 2n = 36.** Native to Europe, on woody clearings, overgrown rocks, boundaries, disturbed grounds with neutral, non-calcareous soils. Hu, Mo, Pl, Ro, Sk, Uk.

**2117. *Epilobium lanceolatum*** Sebast. et Mauri — Perennial, stems shortly ascendent, seldom erect, 10-60 cm high, strigose. **Cypselas prolonged obovoid, planoconvex, apex obtuse, neck distinct, apical hairs 5-7 mm long, 0.9-1.1 x 0.4-0.5 mm. Surface expressive tuberculate, greyish-brown. 2n = 36.** Native to European sunny shrubberies, forest edges and clearings, roadsides, from lowland up to montane zones. Hu, Ro, Sk, Uk.





**2118. *Epilobium montanum* L., *E. silvestre* Kit.** — Perennial, stems erect, 10-80 cm high, rounded, poorly ramified only above, with 2 rows of hairs and scattered glands. **Cypselas narrow ovoid to obovoid, planoconvex, apex obtuse, neck missing, apical hairs 7.5-10 mm long, 1-1.1 x 0.4-0.5 mm. Surface dense tuberculate, nut-brown to brown. 2n = 36.** Native to Eurasia, in woodlands and their paths and edges, in moist stony soils and thickets; almost throughout the Carpathians.

**2119. *Epilobium nutans* F. W. Schmidt, *E. alpinum* Willd. non L.** — Perennial, stems single, erect or ascendent, 5-30 cm high, bare with 2 downy rails below, downy with 4 rails above. **Cypselas prolonged obovoid or fusiform, planoconvex, apex with a neck, base acuminate, 1.3-1.5 x 0.4-0.5 mm. Surface very fine papillose, brown.** Native to European damp, cold stands, brooks edges of subalpine and alpine zones. Cz, Pl, Ro, Sk, Uk.

**2120. *Epilobium obscurum* Schreb., *E. virgatum* Lam.** — Perennial, stems erect or ascendent, 20-70 cm high, simple or much ramified, glabrous below, strigose above. **Cypselas prolonged obovoid, planoconvex, apex obtuse, neck missing, apical hairs 5-7 mm long, 0.8-1 x 0.3-0.4 mm. Surface fine tuberculate in distinct rows, brown. 2n = 36.** Native to European wet places, brook edges, boundaries, meadows, pastures, forests, in all Carpathian territories.

**2121. *Epilobium palustre* L.** — Perennial, stems erect, 10-70 cm high, unbranched, rounded, with 2 longitudinal rails above, strigose and glandular. **Cypselas narrow obovoid, planoconvex, apex with a conspicuous neck, apical hairs 7-10 mm long, 1.7-2 x 0.5-0.6 mm. Surface minute tuberculate, even distributed, dark reddish-brown. 2n = 36.** Native to European wet places, muddy soils, river and lake banks, boundaries; almost throughout the Carpathians.

**2122. *Epilobium parviflorum* Schreb., *E. mollissimum* Horv.** — Perennial,  $\pm$  shortly hirsute, stems erect or ascendent, 20-75 cm high, rounded, glandular. **Cypselas obovoid, planoconvex, apex obtuse, neck missing, apical hairs 5-8 mm long, 0.9-1.1 x 0.4-0.5 mm. Surface dense tuberculate, even distributed, reddish-brown. 2n = 36.** Native to Eurasia, in coastal thickets, lowland and humous forests, moist-clearings, riverbanks; throughout the Carpathians.

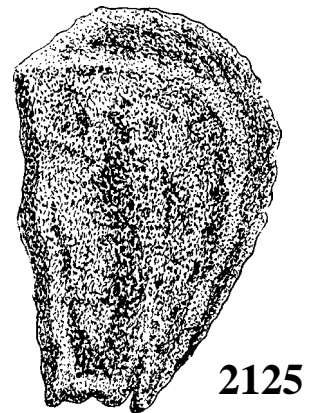
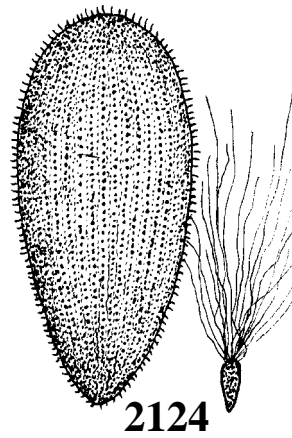
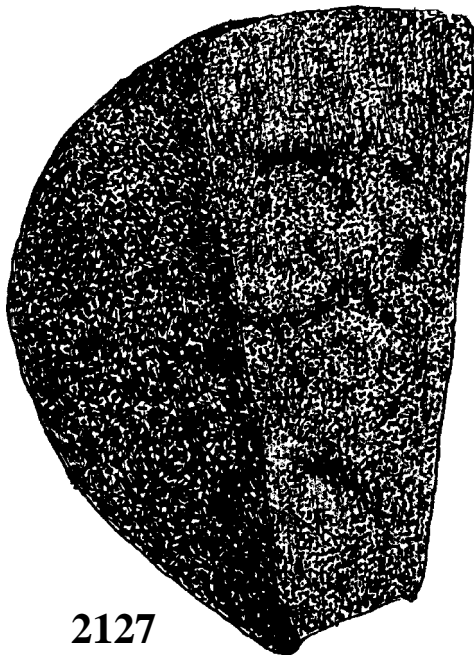
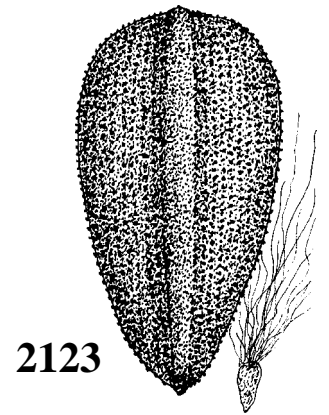
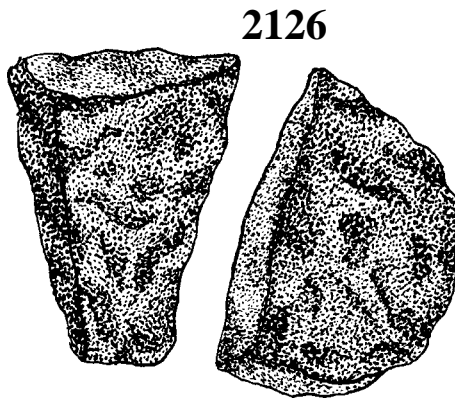
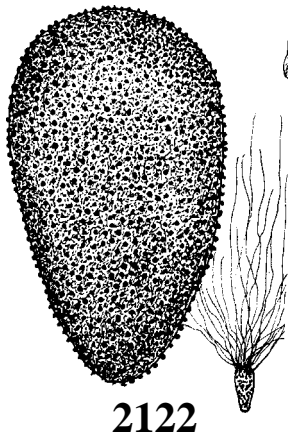
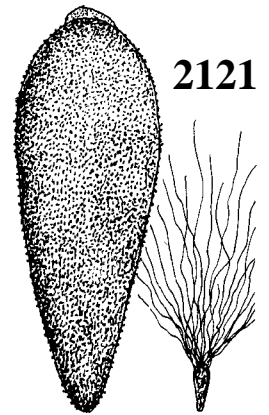
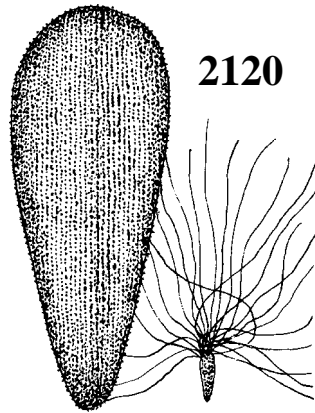
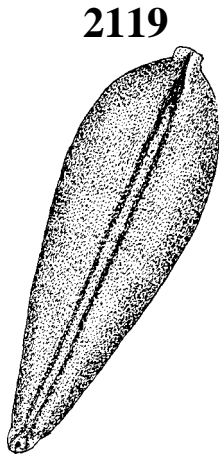
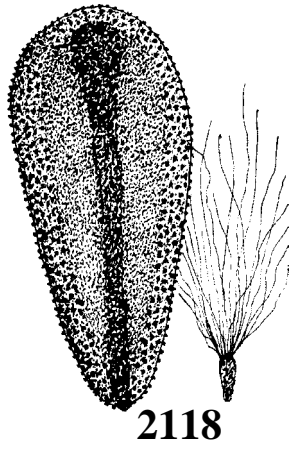
**2123. *Epilobium roseum* Schreb.** — Perennial, stems tufted, erect, 20-80 cm high, branched, 4-angular and glabrous below, rounded, downy with 4 hairy rails above. **Cypselas obovoid, planoconvex, apex obtuse, neck missing, apical hairs 8-9 mm long, 0.8-1.1 x 0.4-0.5 mm. Surface dense tuberculate, tubercles even distributed, reddish-brown. 2n = 36.** Native to European lowlands and uplands, on stream and brookbanks, ditches, in calcareous soils and wet stands; in all Carpathian territories.

**2124. *Epilobium tetragonum* L., *E. adnatum* Griseb.** — Perennial,  $\pm$  bare, stems erect, 20-100 cm high, coarse,  $\pm$  ramified and dense leafy above, glabrous, rounded below. **Cypselas obovoid, planoconvex, apex obtuse, neck missing, apical hairs 6-7 mm long, 0.8-0.9 x c. 0.4 mm. Surface dense tuberculate, tubercles 0.02-0.04 mm high, even distributed, reddish-brown. 2n = 36.** Native to Eurasian damp places, screes silts, brook and riverbanks, roadsides and fields; in all Carpathian territories.

**2125. *Oenothera ammophila* Focke, *Onagra muricata* L. subsp. *ammophila* (Focke) Tischl.** — Biennial, ground rosette 5-10 cm above the earth, stems slanting from base, almost procumbent or ascendent, up to 1 m high, dense leafy. **Seeds very variable, usually  $\pm$  sectorial, sharp angular, 1.8-2.2 x 1.2-1.5 mm. Surface roughen, reticulate, dull, dark purple-brown. 2n = 14.** Assumed place of origin North America, in Europe naturalized in waste, sunny warm places and ruins. Uk.

**2126. *Oenothera biennis* L., *Onagra biennis* (L.) Scop.** — Biennial, stems erect, 10-150 cm high, ramified only above, dense leafy, glandularly downy. **Seeds very variable, usually  $\pm$  sectorial, hilum inconspicuous, 1.5-2 x 1-1.5 mm. Surface dull, glabrous and fine waved-reticulate, dark purple-brown. 2n = 14.** Native to North America, in Europe growing in waste grounds and open habitats, stony-slopes and at river margins; in all Carpathian territories.

**2127. *Oenothera chicaginensis* De Vries ex Renner** — Biennial, often annual, erect, up to 220-260 cm high, simple, branched above, rarely from the base, dotted red, hairs long. **Seeds planoconvex, 1.5-2 x 1.3-1.5 mm. Surface more or less wrinkly, lustreless, reddish or dark-brown. 2n = 14 (var. *minutiflora*).** Native to North America; very rarely



hauling and naturalized into the Carpathians, along railway and road communications, riverbanks, in lowland and upland zones. Pl, Sk.

**2128. *Oenothera depressa*** Greene, *Oe. villosa* Thunb. – Annual to biennial, whole ground rosette silken downy, non-glandular, stems more than 2 m high, without red points. **Seeds very variable, usually  $\pm$  sectorial, sharp angular, 1.6-2 x 1.1-1.4 mm. Surface roughen, dull, reticulate, dark purple-brown.  $2n = 14$ .** Originally growing in North America, hauled on railroads, wharfs, waste places, sandbanks. Hu, Sk.

**2129. *Oenothera erythrosepala*** Borb., *Oe. lamarckiana* De Vries – Biennial, with a ground rosette, stems up to 2 m high, erect, red punctulate, hirsute. **Seeds very variable, usually  $\pm$  sectorial, sharp angular, 1.4-1.8 x 0.8-1 mm. Surface dull, roughen, reticulate, dark purple-brown.  $2n = 14$ .** Originally growing in North America, in central Europe cultivated in gardens as an ornamental, often escaping into waste places, ruins, railroads; in the Carpathians common in some localities. Hu, Pl, Ro, Sk.

**2130. *Oenothera fallax*** Renn., *Oe. cantabrigiana* P. H. Davis – Biennial, ground rosette prostrated on earth, stems erect, glandular, ramified above, reddish punctulate below. **Seeds very variable, usually  $\pm$  sectorial, sharp angular, 1.8-2.2 x 1.4-1.6 mm. Surface reticulate, roughen, dark purple-brown.  $2n = 14$ .** Native to Europe, probably a hybrid of *Oe. biennis* x *erythrosepala*, rare and scattered throughout the territory. Sk.

**2131. *Oenothera hoelscheri*** Renner ex Rostański – Biennial, stems erect, 80-100 cm high, green at the bottom and mid-part., red punctulate. **Seeds very variable, usually  $\pm$  sectorial, sharp angular, 1.6-2.2 x 0.8-1.2 mm. Surface glabrous, dull, roughen, fine reticulate, dark purple-brown.  $2n = 14$ .** Native to Europe, probably of hybrid origin, on ruins, fallow fields, in waste places, on dry sand and gravelly soils. Sk, Uk.

**2132. *Oenothera missouriensis*** Sims – Biennial, decumbent, leaves in a large basal rosette, stems ascending, with strong shoots, up to 20 cm high. **Seeds obovoid, lateral compressed, apex with a crest, 4-4.6 x 2.3-2.8 mm. Surface granular tuberculate, lustreless, yellowish-brown and brown.  $2n = 14$ .** Native to California, on mountain steppes; in

the Carpathians cultivated in gardens as an ornamental plant.

**2133. *Oenothera oehlkersii*** Kappus – Biennial, up to 200 cm high, erect, simple or branched above. **Seeds  $\pm$  semiglobular, convexo-convex, compressed, with a broad margin, 1.7-2 x 1.2-1.4 mm. Surface waved, dull, reddish-brown.  $2n = 14$ .** Native to Germany; in the Carpathians rarely cultivated in gardens as an ornamental, naturalized uniquely.

**2134. *Oenothera parviflora*** L., *Onagra muricata* Moench – Biennial, ground rosette 5-10 cm above the earth, stems up to 2 m high, densely leafy, dark-red below, green above. **Seeds very variable, usually  $\pm$  sectorial, sharp angular, 1.5-2 x 0.9-1.2 mm. Surface reticulate, roughen, dull, dark purple-brown.  $2n = 14$ .** Originally growing in North America, hauling into railroads, wharfs, waste places, ruins, disturbed grounds. Hu, Pl, Ro, Sk, Uk.

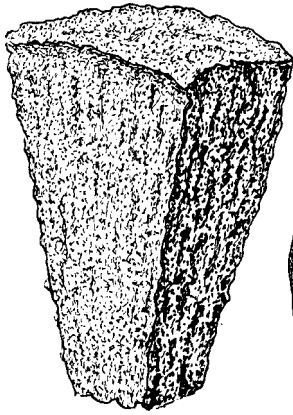
**2135. *Oenothera pycnocarpa*** G. F. Atk. et Bartlett, *O. chicaginensis* Renn. ex Chelone et Blakeslee – Annual, overwintering with ground rosette, stems up to 2-3 m high, branched, erect, red punctulate above. **Seeds very variable, usually  $\pm$  sectorial, sharp angular, 1.2-1.6 x 0.8-1.2 mm. Surface roughen, reticulate, dull, dark purple-brown.  $2n = 14$ .** Originally growing in North America, on ruins, dumps, screes, ways; rarely hauling into the Carpathians.

**2136. *Oenothera renneri*** H. Scholz, *O. mollis* Renner – Biennial, stems green, up to 2 m high, erect, sometimes dotted red, finely bristle, with some glandular hairs. **Seeds prismatic, apex truncate, broader than the bottom or different faces, 1.5-2 x 1-1.4 mm. Surface wrinkly, dull, dark-violet.** Native to North America, on littoral sandbanks; rarely hauling into the Carpathians and naturalized there. Uk.

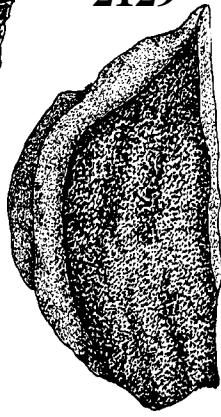
**2137. *Oenothera rubricaulis*** Kleb., *Oe. muricata* auct. non L. – Biennial, stems up to 2 m high, erect, branched, red punctulate, stubborn at base. **Seeds very variable in shape, sectorial, sharp angular, 1.5-2.2 x 1-1.6 mm. Surface glabrous, dull, reticulate, dark purple-brown.  $2n = 14$ .** Native to central and eastern Europe, in open pine sands, on ruins, warm and dry soils. Hu, Ro, Uk.

**2138. *Oenothera salicifolia*** Desf. ex G. Don, *Onagra salicifolia* (Desf.) Spach – Biennial, up to 100 cm

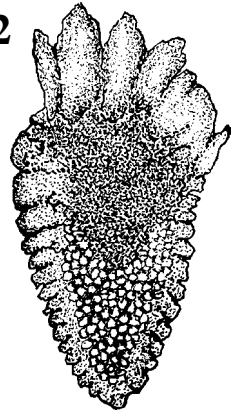
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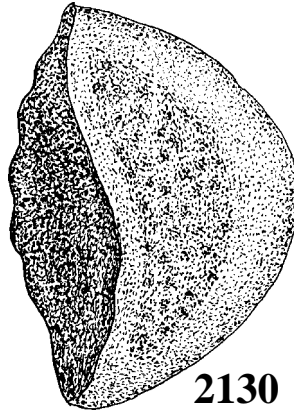
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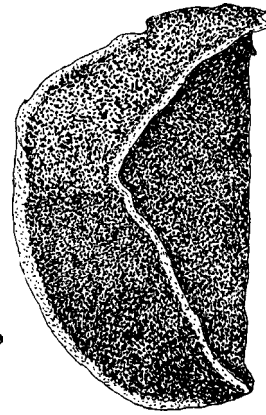
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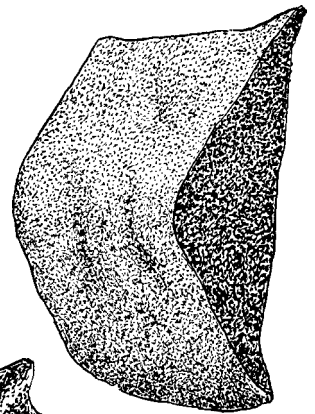
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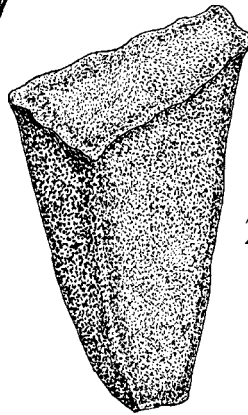
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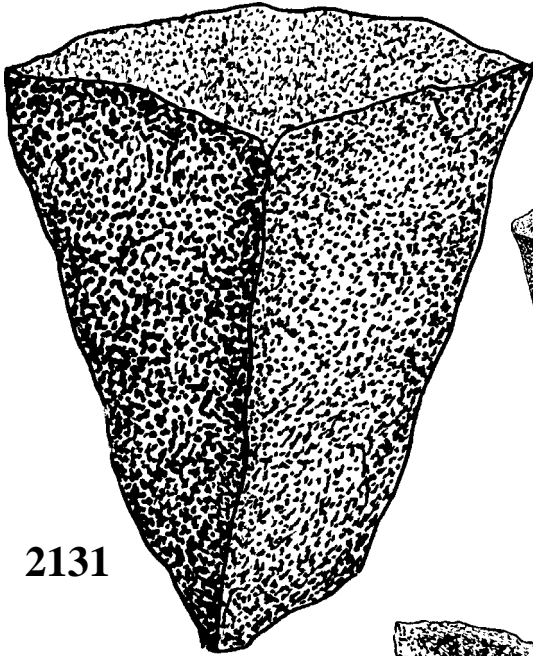
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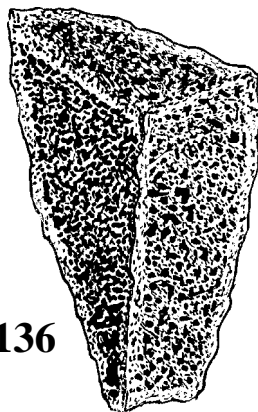
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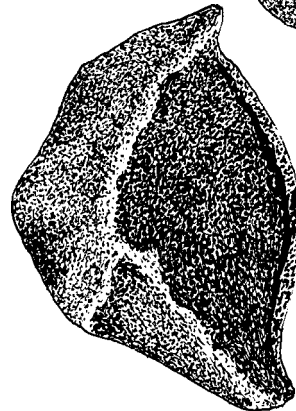
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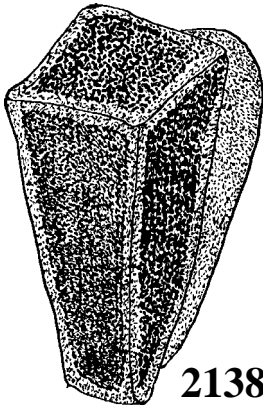
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high, stems reddish dotted papillate, margin of the stem leaves undulate. **Seeds prolonged tri- or quadrangular, sometimes with a distinct wing on 1 or 2 edges, 1.6-2 x 1.1-1.3 mm. Surface waved, lustreless, dark reddish-brown.** Native to Central America, cultivated in botanical gardens, sporadically naturalized. Uk.

**2139. *Oenothera silesiaca*** Renner — Stems slight nodding, without red spots, inflorescence slender and lax. **Seeds of various shapes, lateral compressed, often with distinct edges, 1.5-2 x 1.1-1.3 mm. Surface fine waved, lustreless, reddish-brown. 2n = 14.** Native to central Europe, on disturbed grounds and other open habitats. Pl.

**2140. *Oenothera stricta*** Ledeb. ex Link. — Stems erect, 20-100 cm high, villous, basal leaves oblanceolate or linear, cauline leaves lanceolate, denticulate, undulate. **Seeds narrow obovoid, winged at a roundish apex, bottom gradually narrowed, 1.7-1.9 x 0.7-0.8 mm. Surface waved, faint lustrous, pale-brown. 2n = 14.** Native to temperate South Americas; rarely hauling into the Carpathians.

**2141. *Oenothera strigosa*** (Rydb.) Mackenzie et Bush — Biennial, stems up to 150 cm high, greyish-pubescent, inflorescence lax, flowers reddish. **Seeds in rich shape palette, mostly quadrangular or half-moon, 1.7-2 x 1-1.3 mm. Surface rough, faint lustrous, dark-brown. 2n = 14.** Native to temperate North America; rarely hauling into the Central Carpathians. Hu, Pl, Sk, Uk.

**2142. *Oenothera suaveolens*** Desf. ex Pers. — Biennial, in the first year with a ground rosette, stems erect, 50-150 cm, green, inflorescence without red points. **Seeds very variable, usually  $\pm$  sectorial, sharp angular, 1.6-2 x 1-1.4 mm. Surface dull, roughen, reticulate, dark purple-brown. 2n = 14.** Probably of European origin, rarely naturalized in scattered localities, in orchards, parks and waste stony places. Hu, Pl, Sk, Uk.

**2143. *Circaea alpina*** L. — Perennial, stems simple ascendent, angular, downy only above, 5-20 cm high. **Achenes obovoid or globose, unilocular, 2.8-3.3 x 2.3-2.6 mm. Surface with 1-3 longitudinal ridges, moderate hooked, hairy, dark-brown. 2n = 22.** Native to Eurasia and North America, on shady banks in mixed mountain forests with stony soils rich in loam. Br, Pl, Ro, Sk, Uk.

**2144. *Circaea lutetiana*** L. — Perennial, stems erect, unbranched, scattered hirsute. **Achenes obovate, 2.6-3 x 1.5-1.7 mm. Surface with 4 longitudinal ridges, dense hairy, stalk sparse hairy, with hooked bristles. 2n = 22.** Native to Eurasia, abundant in lowlands, seldom in mountain areas, in shady wet deciduous or coniferous forests, lowland forests; throughout the Carpathians.

**2145. *Circaea x intermedia*** Ehrh. — Perennial, stems ramified, 15-30 cm high, glandularly downy. **Achenes obovoid or globose, falling off in immature state, bilocular, but one loculus more or less abortive, 0.5-0.6 mm long, 3.1-3.5 x 1.8-2.2 mm. Surface with hooked bristles. 2n = 22.** Native to Europe as a hybrid (*C. alpina* x *lutetiana*), mostly barren, spreading vegetatively; in all Carpathian mountain areas. Hu, Pl, Ro, Sk, Uk.

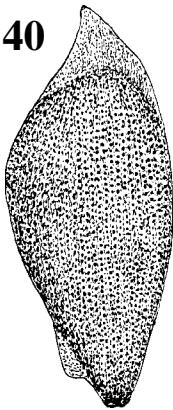
**2146. *Ludwigia palustris*** (L.) Elliot, *Isomardia palustris* L., *L. apetala* Walter — Annual up to perennial, aquatic and marshy plant, bare, 5-50 cm high, stems procumbent, rooting down or swimming, filiform. **Seeds cylindric, apex truncate, base narrowed and curved, 0.7-0.9 x 0.3-0.4 mm. Surface smooth, lustrous, light-brown. 2n = 16.** Native to southwestern Europe, Africa, America, sporadically occurring in wet places. Hu, Pl, Ro, Sk, Uk.

**2147. *Clarkia elegans*** Dougl. — Annual, similar to *C. pulchella*, glabrous, branched, up to 60 cm high. **Seeds obovoid, apex obtuse, base narrowed, ventral side flat, dorsal convex, 1.3-1.7 x 0.9-1.1 mm. Surface verrucose, lustreless, pale-brown. 2n = 24.** Originally growing in North America; in the Carpathians occurring in many cultivars, grown in gardens as an ornamental, rarely escaping.

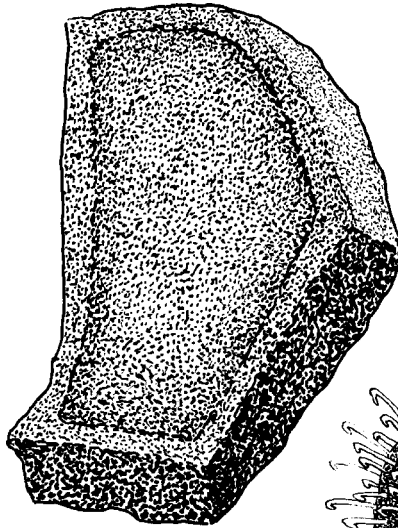
**2148. *Clarkia pulchella*** Pursh — Annual, up to 50 cm high, bare, stems erect, branched. **Seeds obovoid, ventral side flat, dorsal convex, apex obtuse, base narrowed, 1.4-1.8 x 1-1.2 mm. Surface verrucose, lustreless, dark-brown. 2n = 14, 18.** Originally growing in North America; in the Carpathians seldom cultivated as an ornamental summer plant in gardens.

**2149. *Fuchsia boliviana*** Carr. — Shrub up to 60-100 cm high. **Seeds semireniform, apex obtuse, base narrow with a rounded hilum, 0.9-1.1 x 0.5-0.6 mm. Surface fine reticulate, slight lustrous, reddish-brown.** Native to Bolivia; introduced into

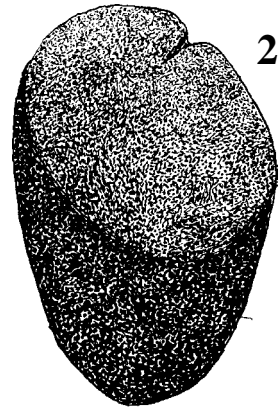
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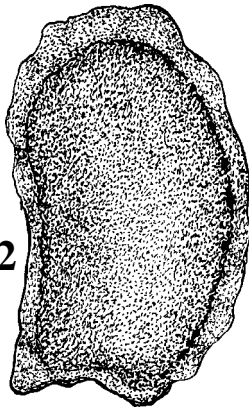
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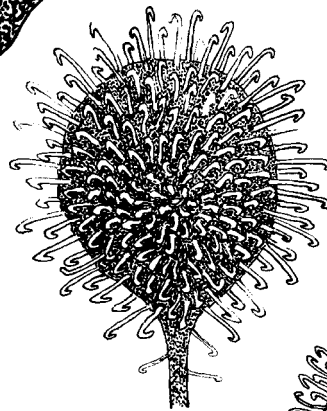
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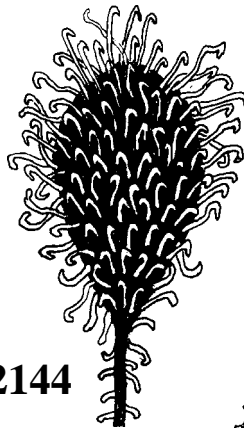
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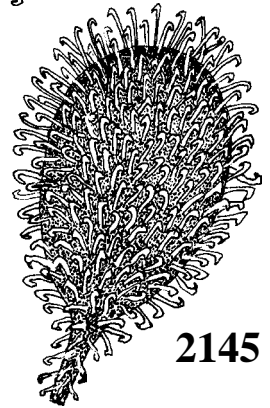
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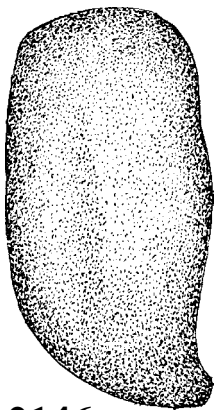
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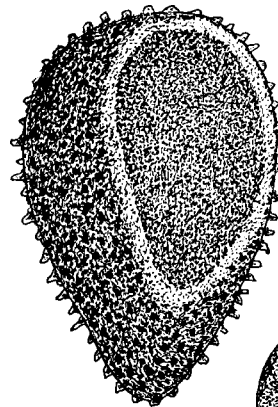
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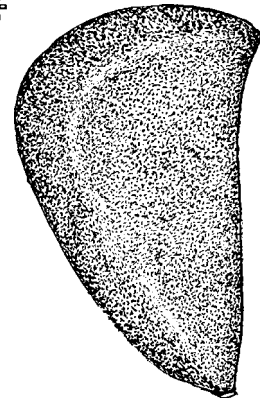
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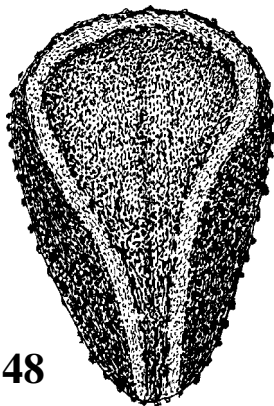
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Europe; in the Carpathians grown as an in- or out-door ornamental.

**2150. *Fuchsia magellanica*** Lam., *F. coccinea* Curt., *F. macrostemma* Ruiz et Pav. — Shrub up to 1-3 m high, twigs glabrous or pubescent. **Seeds very variable, obovoid to reniform, or rectangular, slight flattish, 0.9-1.1 x 0.5-0.7 mm. Surface lustrous, faint reticulate, yellowish-brown. 2n = 44.** Originally growing in Peru and Chile; in the Carpathians cultivated as an ornamental in two var. (*globosa* and *conica*), locally naturalized.

**2151. *Gaura biennis*** L. — Biennial, plant often hirsute, stems 1-2 m high, erect with numerous twigs. **Fruits nut-like with 1-4 seeds, rhomboidal, 4-sided, ± ovoid, widen gradually, apex narrowed, stalk-like base 1/2 the diameter or more of the widest part of fruit, do not open to release seeds, 7-8 x 4-4.4 mm. Surface woody, humpy, lustreless, margins short hirsute, brown.** Originally growing in Mexico; in the Carpathians rarely cultivated as an ornamental in gardens, occasionally escaping.

#### 98. TRAPACEAE

**2152. *Trapa natans*** L. — Annual, water plant, stem 50-200 cm, submerged, non-branched, with a leaf rosette on the water surface. **Fruits nuts, variously shaped, ± stellate, base with 2-4 long triangular sharp spines up to 20 mm long, apex concave, inner part with 3-5 mm long converging hairs, 20-30 x 20-45 mm. Surface glabrous, tube sulcate, ridges olive-brown, to black. 2n = 36, 40, 48.** Native to central and southern Europe, Asia Minor and north Africa, in still waters, dead stream arms; in all Carpathian territories. variously-shaped nuts are swollen at the middle and have 2-4 sharp spines.

#### 99. HALORAGACEAE

**2153. *Myriophyllum spicatum*** L. — Perennial, aquatic, stem up to 2 m long, leaves in quadruple whorls consisting of many filiform leaflets. **Mericarps (subglobose schizocarp falled into 4 segments) cylindric, dorsal side convex, two ventral sides flat with longitudinal ridge, edges with large tubercles, 2-2.4 x 1.2-1.5 mm. Surface dorsal dense tuberculate, roughen, olive-green to brown. 2n = 28, 36, 42.** Native to Eurasian still and slow-flowed waters; throughout the Carpathians.

**2154. *Myriophyllum verticillatum*** L. — Perennial, stem to 1-3 m long, leaves in 5-fold whorls, composed

of many filiform leaflets. **Mericarps quadriblock, cylindric or subglobose, dorsal side convex, two ventral sides flat, with longitudinal ridge, 1.8-2.2 x 1.2-1.5 mm. Surface smooth, nut-brown. 2n = 28.** Native to the Northern Hemisphere, in still and free-flowed waters; in all Carpathian territories.

#### 100. HIPPURIDACEAE

**2155. *Hippuris vulgaris*** L. — Perennial, aquatic or marsh plant, glabrous, stems simple, erect, 20-100 cm high, with leaves in 6-15-fold whorls. **Fruits, egg-shaped, spherical, apex truncate, calyx as a low-annular rim, 1.6-2 x 1-1.2 mm. Surface dull to lustrous, glabrous, reticulate, dark- to black-brown. 2n = 32.** Native to Eurasian still and slow-flowed waters, muddy banks of ponds, ditches; in all Carpathian territories.

#### 101. RHAMNACEAE

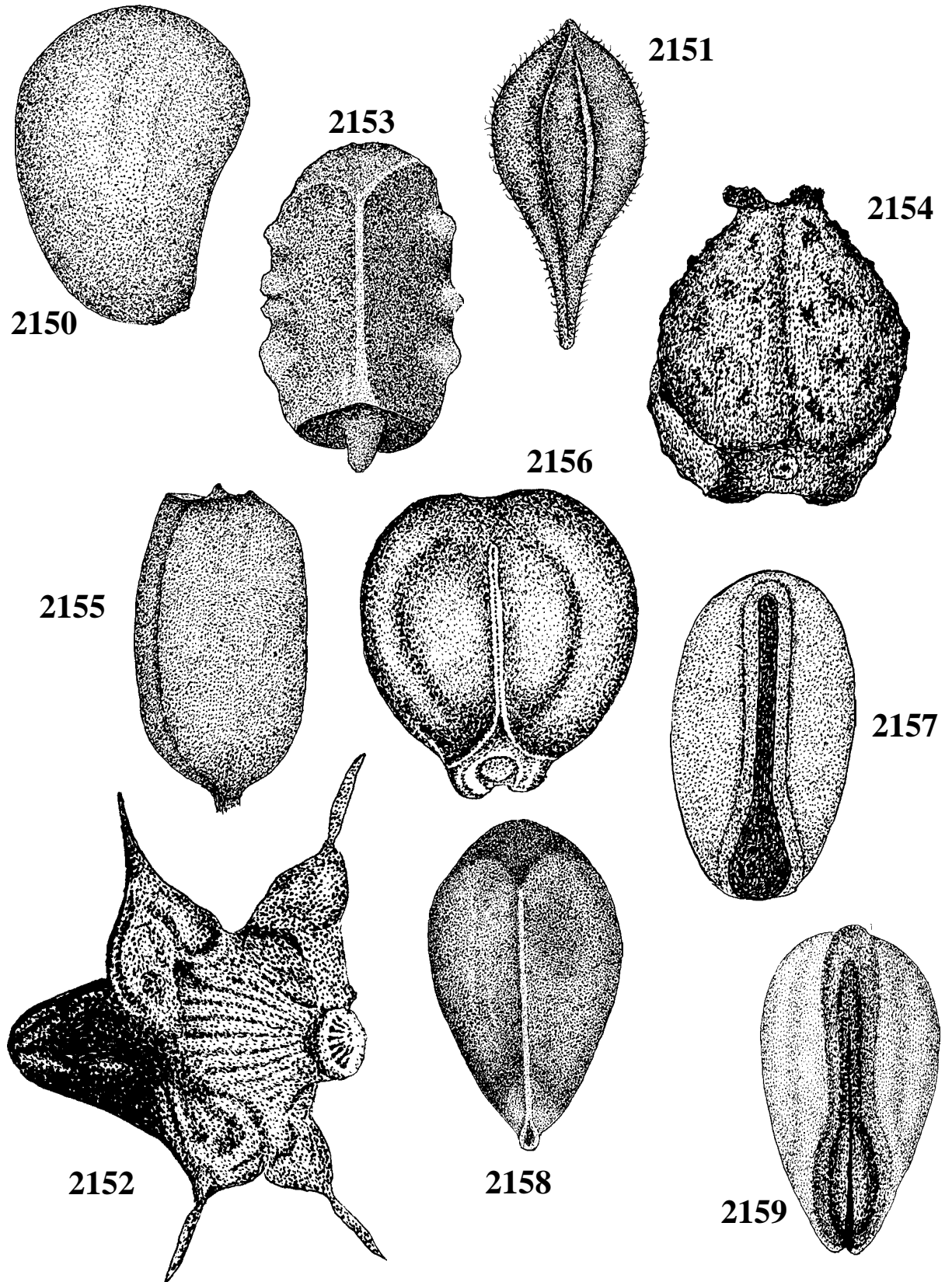
**2156. *Frangula alnus*** Mill., *Rhamnus frangula* L. — Shrub, 4-5 m high, bark of twigs smooth. **Stones broad obovoid, strong dorsoventral flattish, ventral ridge not reaching the apex, base with a large open hilum, 4.5-5 x 4-4.5 mm. Surface smooth, light yellowish-green, base orange. 2n = 20, 22.** Native to Eurasia, common in damp woods and bogs, thickets, in mosses and fens; in all Carpathian territories.

**2157. *Rhamnus alaternus*** L. — Shrub, up to 8 m high, leaves evergreen, leathery, glabrous, lustrous, flowers yellowish-green. **Stones ellipsoid or obovoid, dorsal side convex, ventral ± flat, deep longitudinal furrow bordered with a distinct rim, 4.7-5.2 x 2.5-3 mm. Surface glabrous, slight lustrous, yellowish-brown.** Native to the Mediterranean, in wood clearings, ravines, shrubberies; successively penetrated into the Carpathians. Uk.

**2158. *Rhamnus catharticus*** L. — Shrub or small tree, 4-6 m high, branches opposite. **Stones sectorial, slight lateral flattish, elliptic, base with a small triangular hilum, 5-5.6 x 2.9-3.3 mm. Surface smooth, dull, with ventral ridge, hilum olive-brown. 2n = 24.** Native to Eurasia, sunny stony slopes, light woodlands and their edges, riverbanks; throughout the Carpathians.

**2159. *Rhamnus imeretina*** Booth — Shrub, up to 1.5-3 m high, with large leaves (10-25 x 7-12 cm) downy below. **Stones obovoid, dorsal side convex, ventral ± flat, deep longitudinal furrowed with a distinct**





**rim, bottom narrowed, 4.9-5.4 x 2.9-3.3 mm. Surface glabrous, slight lustrous, yellowish-brown.** Native to the Caucasus and Asia Minor; in the Carpathians sporadically planted as an ornamental in parks and gardens. Uk.

**2160. *Rhamnus saxatilis* Jacq.** — Shrub, up to 2 m high, erect or procumbent, richly branched, twigs often knotted and thorny. **Stones obovoid, 4.2-4.6 x 2.2-2.5 mm, closed in a shell, ventral side with a deep longitudinal furrow surrounded by a rim, 4.7-5.2 x 2.3-2.7 mm. Surface smooth, lustreless, brown, shell blackish. 2n = 24.** Native to central and southern Europe, in lowlands and uplands, on skeletal substrates, especially calcicole, at edges of forests and shrubberies. Au, Hu, Pl, Ro, Sk.

**2161. *Rhamnus tinctoria* Waldst. et Kit.** — Tree, with erect or ascending branches, up to 1.5-2 m high, young twigs pubescent. **Stones ellipsoid, dorsal side convex, ventral rooflike with a longitudinal ridge and rounded hilum, 4.5-5 x 2.5-3 mm. Surface smooth or faint lustrous, blackish-brown.** Native to southeastern Europe, on dry mountain rocky slopes, at wood margins, shrubberies with calcareous grounds. Hu, Mo, Ro, Uk.

**2162. *Paliurus spina-christi* Mill., *P. australis* Gärtn., *P. aculeatus* Lam., *Rhamnus paliurus* L.** — Shrub up to 3 m high, twigs prickly, branched. **Fruits pome, disciform, depressed-globose, surrounded by a broad horizontal wing, 20-28 x 20-28 mm. Surface undulate, radial veinous, brown to reddish-brown.** Native to southern Europe and western Asia, on dry stony slopes in lowlands, in shrubberies, a invasive forest weed, cultivated for hedges. Hu, Ro, Uk.

**2163. *Ceanothus americanus* L.** — Shrub up to 1 m high, twigs slender. **Stones ellipsoid to obovoid, dorsal side convex, ventral slight flattish with an indistinct ridge, base arillate, 2.6-3.0 x 1.8-2.1 mm. Surface smooth, high glossy, dark blackish-brown.** Originally growing in North America, seldom cultivated as an ornamental in parks and gardens in warmer areas. Hu, Uk.

**2164. *Zizyphus jujuba* Mill., *Rhamnus zizyphus* L.** — Shrub up to 8 m high, twigs prickly, glabrous. **Stones ellipsoid, with a distinct ridge on ventral side, apex acuminate, base narrowed with round hilum, 8-15 x 6-8 mm. Surface with longitudinal furrows, humpy, pale- or reddish-brown.** Native to temperate

Asia; cultivated or subsontaneous in south Europe, having edible fruits. Ro.

## 102. VITACEAE

**2165. *Vitis amurensis* Rupr., *V. thunbergii* Rgl.** — Twinning shrub, young twigs and usually also the leaves hirsute. **Seeds cordiform, depressed area on dorsal side with elliptic chalaza and seed stitch, 4.7-5.2 x 3.6-4 mm. Surface slight granulate, smooth, lustrous, dark-brown.** Native to the Far East, on riverbanks, shrubberies, rocky slopes; rarely cultivated in parks, and partly used in breeding as a frost resistant. Ro, Uk.

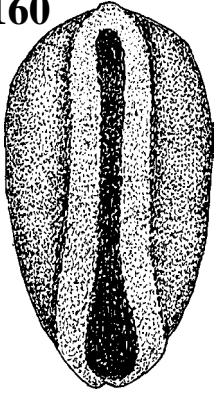
**2166. *Vitis berlandieri* Planch.** — Liana, young shoots angled, floccose, honey-coloured, pubescent, bark of mature shoots ashy. **Seeds slight ellipsoid, dorsal side convex with ovoid central area, ventral side flattish with a longitudinal rib and 2 lateral prolonged sockets, 4.8-5.2 x 3.6-3.9 mm. Surface fine waved, lustrous, brown.** Native to North America; in the Carpathians cultivated in ampelographic collections as possible breeding material.

**2167. *Vitis labrusca* L., *V. ficifolia* Bge.** — Liana, shoots and young leaves rusty hirsute. **Seeds globose to broad obovoid, noselet short, chalaza tear-shaped, 4.7-5.3 x 3.8-4.2 mm. Surface fine granulate, slight glabrous, dark-brown.** Native to North America, one of the parents of American wine cultivars. Hu, Ro, Sk, Uk.

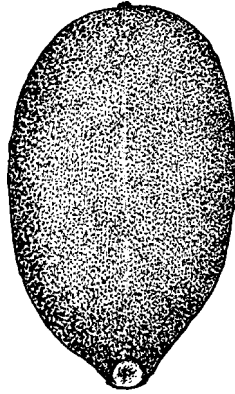
**2168. *Vitis riparia* Michx., *V. vulpina* L.** — One-year shoots chestnut-brown, with violetish-velvet cover, smooth, fine lineated and dotted. **Seeds heart-shaped, dorsal side convex with rounded or tear-shaped socket in the middle, ventral side ± flat, with a longitudinal rib and 2 lateral prolonged concavities, 4.4-4.8 x 3.6-4 mm. Surface indistinct granulate, slight lustrous, brown.** Native to North America, in wet alluvial calcareous soils; the most important understock in viniculture, in plant virology used as an indicator. Hu, Ro, Sk, Uk.

**2169. *Vitis rupestris* Scheele** — Shrub, trail plant, up to 2 m high, young twigs coppery-green or violet, bare or ± hirsute, older twigs angular, lustrous, chestnut-brown. Very similar to *V. sylvestris*. **Seeds similar to *V. riparia*, 4-5 x 4 mm. Surface smooth, lustrous, dark-brown.** Native to North America, on stone, rocky, dry and warm slopes; high resistance against

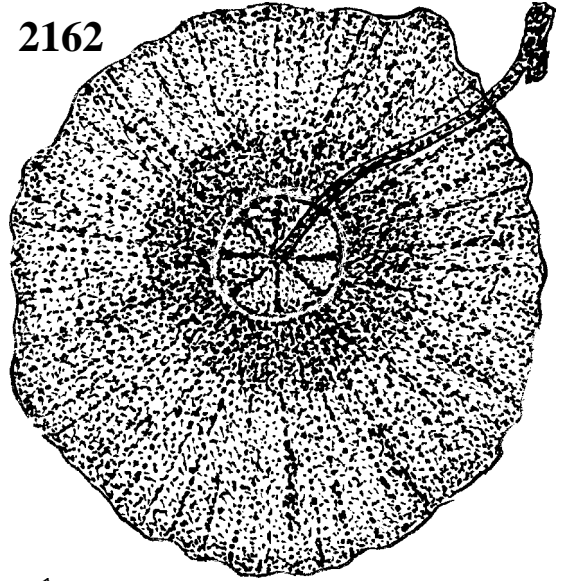
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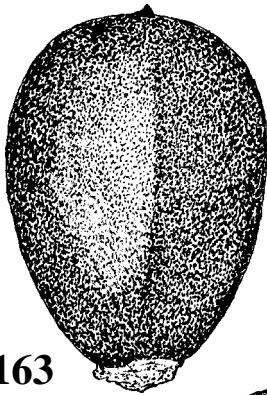
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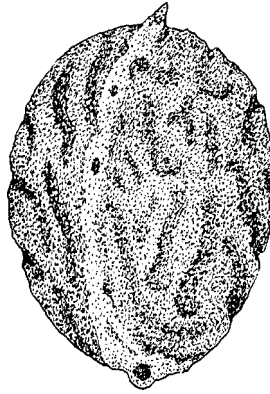
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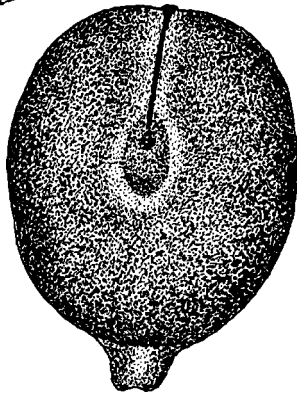
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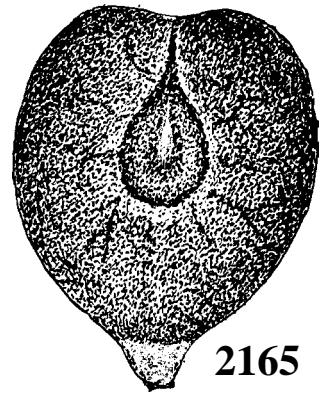
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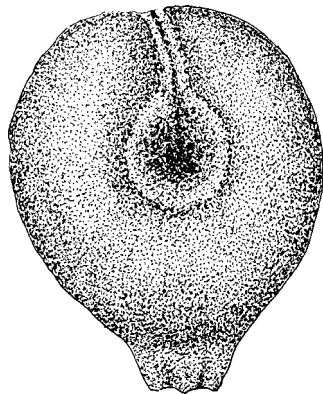
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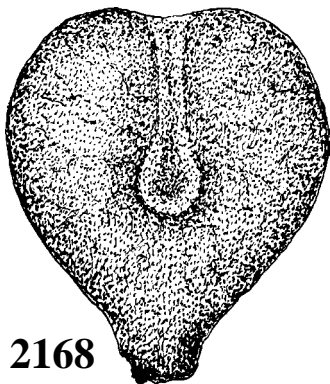
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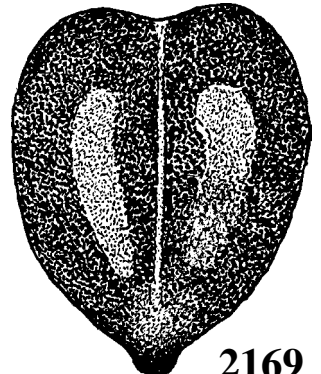
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2169



*Phylloxera vastatrix*, used in viniculture as understock for *V. vinifera*.

**2170. *Vitis sylvestris*** C. C. Gmel. — Twinning shrubs with dimorphic foliage, dioecious, the leaves of male plants being more deeply lobed. **Seeds subglobose with a short truncate beak below, 4-6 x 3-4 mm. Surface granulate, faint lustrous or lustreless, pale to dark-brown. 2n = 38.** Native to European lowland forests and coastal scrubs, naturalized species originated from *V. vinifera*. Hu, Mo, Ro, Sk, Uk.

**2171. *Vitis vinifera*** L. — Shrubs, grown in many cultivars with erect or twinning shoots. **Seeds cordate, obovoid, slight flattish, base narrowed, dorsal side convex, ventral side keeled, 6.2-7 x 3.8-4.2 mm. Surface lustreless, slight granulate, light and dark-brown. 2n = 38.** Originally spread from western Asia (Caucasus), at present commonly cultivated for its fruits and wine-making, in warmer areas of the whole Carpathians, widely naturalized.

**2172. *Vitis coignetiae*** Polliat ex Planchon — In addition to fruiting vines, several species of *Vitis* from eastern Asia are cultivated in gardens for their ornamental foliage. **Seeds ± cordiform, dorsal side convex, with tear-shaped socket in the middle, ventral side compressed, with longitudinal rib in the middle and two oblong depressions, 4-4.5 x 3-3.4 mm.** Native to Japan; in the Carpathians rarely cultivated in parks, in warmer regions.

**2173. *Parthenocissus henryana*** Diels et Gilg, *P. henryi* Graebn. — Small creeper, stem and twigs slender, tendrils 4-5-armed. **Seeds broad obovoid to cordiform, dorsal side convex, ventral flat, 4.3-4.7 x 3.3-3.7 mm. Surface granulate, faint lustrous or dull, greyish-brown.** Native to China and Japan, very susceptible to climate. Ro.

**2174. *Parthenocissus inserta*** (A. Kern.) Fritsch, *Vitis inserta* A. Kern. — Shrub, creeper with deciduous leaves, tendrils with 3-5 twigs without sticky sheets. **Seeds broad cordiform, dorsal side convex, ventral side flat, with one longitudinal rib and 2 furrows, 4-4.8 x 3.7-4.2 mm. Surface granulate, faint lustrous, greyish-brown.** Native to North America; in the Carpathians cultivated in parks and gardens, for covering chatter-houses, balconies and walls, in warmer areas. Hu, Ro.

**2175. *Parthenocissus quinquefolia*** (L.) Planch, *Ampelopsis quinquefolia* (L.) Michx. — Shrub, creeper

up to 30 m high, with 8-12 armed tendrils and twigs dark-green, sometimes with aerial roots. **Seeds cordiform or obovoid, dorsal side convex with roundish socket, ventral side compressed with one longitudinal rib and one or two furrows, 4-4.5 x 3.5-4 mm. Surface granulate, faint lustrous, reddish-brown. 2n = 40.** Originally growing in North America; in the Carpathians commonly cultivated for ornamental covering walls and chatter-houses, in warmer areas, locally naturalized.

**2176. *Parthenocissus tricuspidata*** (Siebold et Zucc.) Planch, *Ampelopsis veitschii* Lynch — Shrub, creeper, up to 20 m high, tendrils ramified, short, with sticky sheets. **Seeds broad cordiform, dorsal side convex, ventral flat, 3.3-3.7 x 3.3-3.8 mm. Surface granulate, faint lustrous, greyish-brown. 2n = 40.** Native to eastern Asia; in the Carpathians often cultivated in gardens and parks, for covering walls, seldom naturalized. Hu, Mo, Ro, Sk, Uk.

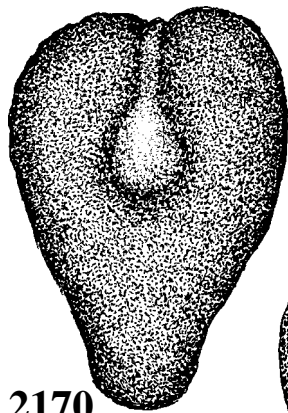
**2177. *Ampelopsis aconitifolia*** Bge., *A. dissecta* Carr. — Creeper or twining shrub, shoots slender with tendrils. **Seeds globose, dorsal side convex, ventral flattish, with longitudinal rib and two oblong depressions, noselet below very short, 4-4.8 x 3.7-4.3 mm. Surface granulate, lustreless, brown.** Native to northern China and Mongolia, cultivated as an ornamental in parks or near walls. Ro.

**2178. *Ampelopsis japonica*** (Thunb.) Makino, *Vitis coignetiae* Pulliat — Shrub, up to 10 m high, with tuberculous root, glabrous, striate sprouts. **Seeds spherical, planoconvex, with 1 or 2 depressions on ventral side, 3.5-4 x 3.3-3.7 mm. Surface fine waved, lustrous, reddish-brown.** Native to Japan; in the Carpathians rarely cultivated in parks and at walks, in warmer regions, as ornamental.

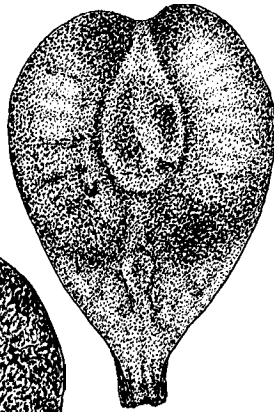
### 103. ANACARDIACEAE

**2179. *Rhus copallina*** L. — Shrub or a small tree, up to 5-6 m high, base thin, reddish-brown, leaves deciduous, alternate, with 9-21 leaflets, leaf stalk winged, base thin, reddish-brown. **Seed horizontal oval and slight compressed, at bottom large hilum with caruncle and two strings, 2.1-2.3 x 3.1-3.5 mm. Surface smooth, lustrous, dark-brown.** Native to North America; in the Carpathians rarely cultivated in parks as an ornamental tree.

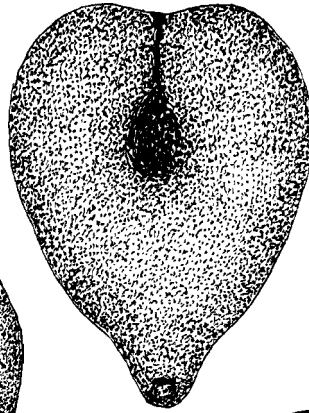
**2180. *Rhus coriaria*** L. — Shrub or tree, evergreen, up to 3 m high, young twigs and petioles dense hispid,



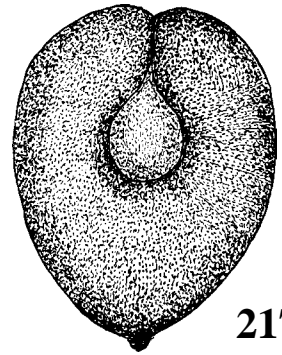
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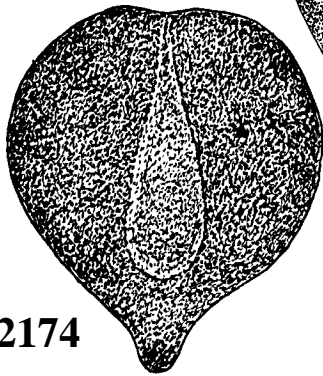
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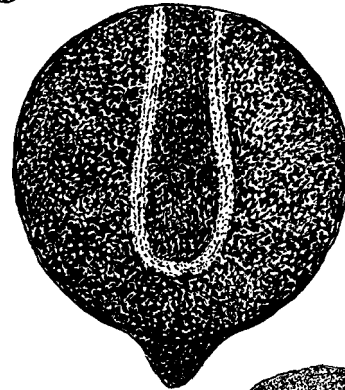
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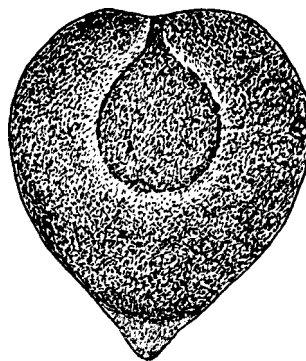
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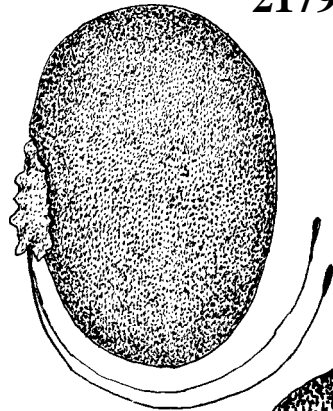
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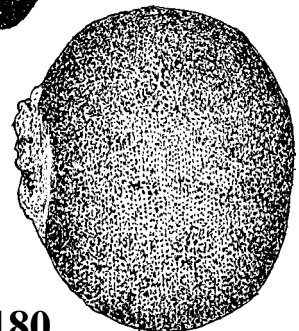
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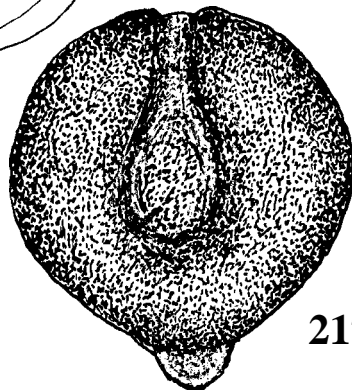
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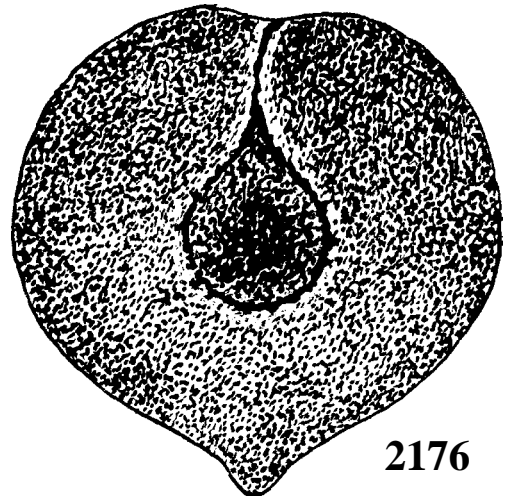
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2176

leaves imparipinnate. **Seeds ellipsoid or slight reniform, lateral compressed, hilum on ventral side arillated, 3.1-3.5 x 2.7-3 mm. Surface smooth or short hispid, faint lustrous, chocolate-brown or grey.** Native to southern Europe, in rocky places and scrubs, at low altitudes; in the Carpathians rarely cultivated in parks. Hu, Mo, Ro, Uk.

**2181. *Rhus toxicodendron* L., *Toxicodendron pubescens* Mill.** — Shrub, branches procumbent and rooting down, brown to mentose. **Drupes more or less globular, lateral flattish, 5-6 x 4.5-5.5 mm. Surface smooth or fine furrowed, lustreless, straw-yellow. 2n = 30.** Originally growing in North America; in the Carpathians sometimes cultivated in parks and gardens. Hu, Pl, Sk, Uk.

**2182. *Rhus typhina* L., *R. hirta* (L.) Sudw.** — Shrub, up to 7 m high, twigs in young stage brown downy. **Seeds broad elliptic, horizontal oval, lateral compressed, with short or long hilum, 2.5-3.6 x 1.7-2.7 mm. Surface smooth, lustreless, dense covered with long purple-red hairs, pale-brown.** Native to North America; in the Carpathians often cultivated for ornament in parks and gardens, locally naturalized. Hu, Pl, Ro, Sk, Uk.

**2183. *Cotinus coggygria* Scop., *Rhus cotinus* L.** — Perennial, 1 to 5 m high, glabrous. **Drupes cordate to reniform, 4-4.5 x 2.6-3 mm. Surface reticulate, fine ribbed and veinous, reddish-brown. 2n = 30.** Native to Eurasia, on sunny shrubby slopes, forest steppes with basic, often calcareous soils, dry rocky slopes. Hu, Mo, Pl, Ro, Sk, Uk.

**2184. *Pistacia lentiscus* L.** — Evergreen summer shrubs or trees, 1-8 m high, downy leaves even or odd, simple or three-dentate. **Fruits nuts, obovoid, lateral flattish with small beak at apex, 4.9-5.3 x 4.4-4.7 mm. Surface with thin ruminant peel, faint lustrous, reddish-brown or black.** Native to the Mediterranean, important as a mastic yielding species; rarely cultivated in warmer parts of the Carpathians. Mo, Ro, Uk.

**2185. *Pistacia terebinthus* L.** — Small deciduous trees or shrubs, up to 5 m high. **Fruits nuts, obovoid, lateral compressed, apiculate, 6-6.5 x 4.5-5 mm. Surface reticulate, lustreless, first reddish, later on turning brown.** Native to the Mediterranean region, in dry, open woods and on rocky slopes with calcareous grounds; in the Carpathians rarely cultivated

as an interesting tree in parks, its leaves contain up to 60 % of tans.

**2186. *Pistacia vera* L.** — Small deciduous tree or shrub, up to 5 m high, with 1-3 leaflets, thin, puberulent when young. **Fruits nuts, ovoid, biconvex, ribbed on dorsal and ventral sides, 1.5-2.5 x 1-1.3 cm. Surface glabrous, lustreless, various coloured yellowish, reddish, dark-violet.** Native to temperate Asia; grown for its edible seeds in southern Europe; in the Carpathians cultivated rarely in parks as an interesting tree. Mo, Uk.

#### 104. ACERACEAE

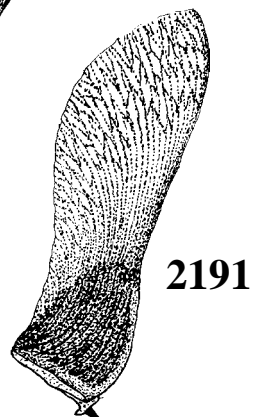
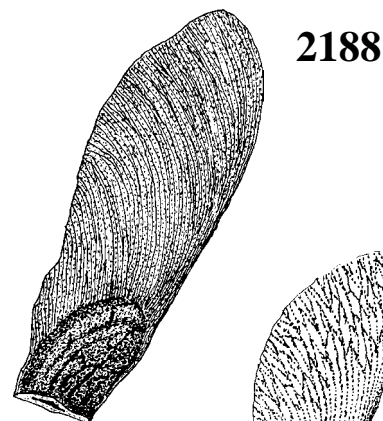
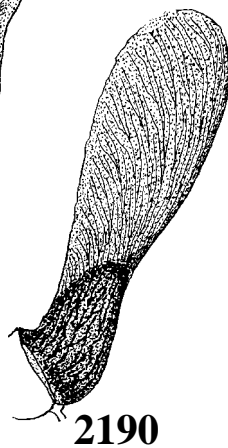
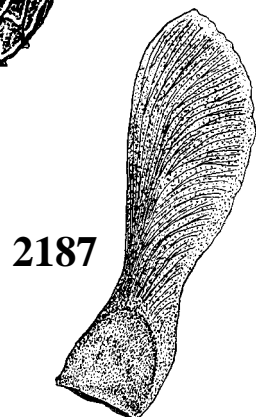
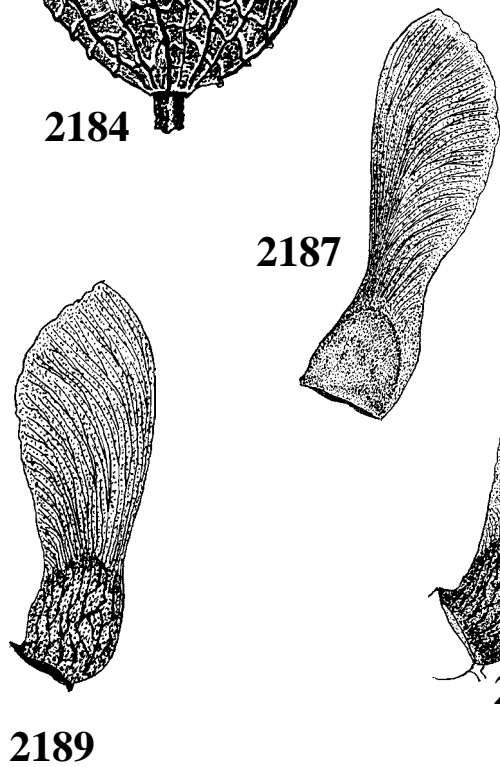
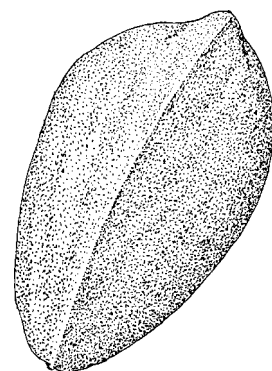
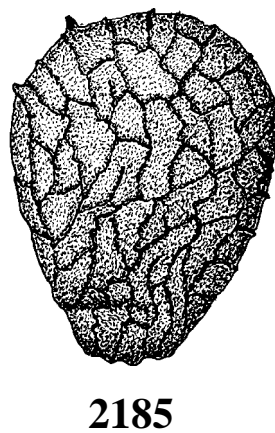
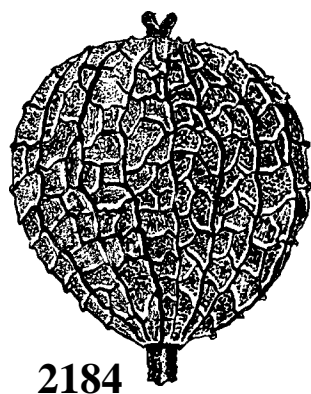
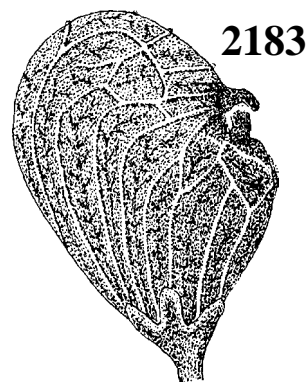
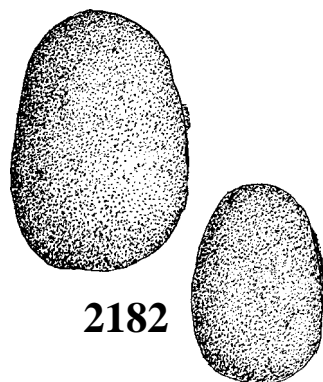
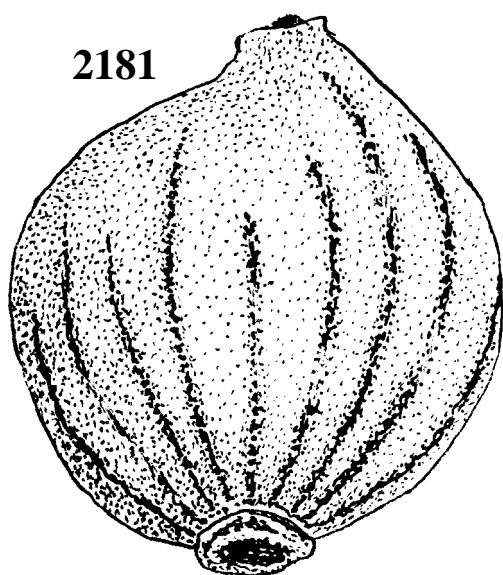
**2187. *Acer campestre* L.** — Shrub or small tree, up to 20 m high, trunk often curved, young shoots hairy. **Fruits double samaras with acute wings, seed-bearing part strong flattish, 23-30 x 9-15 mm (including wing). Surface hairy or glabrous, with or without glands, yellowish-green to brown. 2n = 26.** Native to Europe, but rare in the Mediterranean region, in light woodlands, forests steppes and shrubby sunny slopes; as an ornamental planted for hedges, in parks and streets; in most of the Carpathians.

**2188. *Acer circinatum* Pursh** — Shrub, up to 12 m high lay-out tree. **Fruit double samaras with acute wings, seed-bearing part very flattish, glabrous, with distinct ribs, 30-35 x 9-15 mm (including wing). Surface reddish-brown, wings pale-brown.** Originally growing in North America; in the Carpathians often cultivated as a very ornamental species in parks in many cvs, sometimes planted in forests.

**2189. *Acer davidii* Franch.** — Tree, up to 15 m high, twigs lustrous, whitish striate, flowers yellow, leaves ovoidal, apex acuminate. **Fruits double samaras, winged, 21-25 x 6-8 mm (including wing). Surface veinous, lustrous, pale-brown (wing) and dark-brown (bearing part).** Native to central China; in the Carpathians planted in parks as an ornamental.

**2190. *Acer ginnala* Maxim.** — Tree, up to 20 m high. **Fruits double samaras with inacute angle wings, seed-bearing part flattish, distinct veinous, 27-35 x 7-9.5 mm (including wing). Surface pink-brown, wings pale-brown. 2n = 26.** Native to eastern Asia; in the Carpathians seldom cultivated in parks. Mo, Uk.

**2191. *Acer laetum* C. A. Mey., *A. cappadonicum* Gled.** — Tree, up to 20 m high. **Fruits**



**double samaras, seed-bearing part strong flattish, fine reticulate, faint venous, 30-36 x 9-11 mm (including wing). Surface greyish-brown, wings rose to pale-brown.** Originally growing in the Caucasus and western Asia, in mountain forests as a relict species; in the Carpathians sporadically cultivated in parks.

**2192. *Acer monspessulanum* L., *A. trilobatum* Lam.** — Shrub or tree, up to 12 m high, with lashed scales of buds. **Fruits double samaras, seed-bearing part slight flattish, glabrescent, 16-22 x 4-7 mm (including wing). Surface distinct pale.** Native to southwestern Europe; often planted in parks in many cvs. Mo, Ro, Sk, Uk.

**2193. *Acer opalus* Mill., *A. italum* Lauth., *A. opulifolium* Chaix** — Shrub or tree, up to 15 m high. **Fruits double samaras with acute, horizontal wings, seed-bearing part nearly globose, reticulate, non-venous or only rarely, 30-40 x 12-15 mm (including wing). Surface dull, reddish-brown, wing pale-brown,** Endemic to southwestern Europe, in lowlands and uplands on calcareous, stony stands; in the Carpathians seldom cultivated in parks.

**2194. *Acer palmatum* Thunb.** — Shrub or tree, up to 8 m high, twigs bare, thin. **Fruits double samaras with acute wings, seed-bearing part nearly globose, distinct venous brown, 12-16 x 5-6 mm (including wing). Surface dull, faint reticulate, wings yellowish-brown. 2n = 26.** Originally growing in southeastern Asia; sometimes cultivated in parks in many cvs.

**2195. *Acer pensylvanicum* L.** — Tree or shrub, up to 12 m high, bark brownish-grey, leaves enough big, 4-angular. **Fruits double samaras, seed-bearing part strong compressed and deflexed, distinct venous, 26-30 x 9-11 mm (including wing). Surface reddish-brown.** Originally growing in North America; in the Carpathians cultivated as an ornamental in parks and gardens, rare.

**2196. *Acer platanoides* L.** — Deciduous tree, up to 30 m high, bark longitudinal cracked, scaled, twigs bare, glossy-brown. **Fruits double samaras with acute wings, seed-bearing part strong flattish, 35-45 x 12-15 mm (including wing). Surface glabrous, without glands, orange-brown. Seeds broad ovate, flattish, 9-12 x 6-8 mm. Surface blackish. 2n = 26.** Native to European deciduous

forests; often planted as an ornamental in parks and communities, throughout the Carpathians.

**2197. *Acer pseudoplatanus* L.** — Tree, up to 30 m high, bark scaled, twigs bare. **Fruits double samaras with acute wings, seed-bearing part globose, not flattish, glabrous or sometimes with solitary hairs, with or without glands, 30-40 x 8-12 mm (including wing). Surface orange-brown, seed-bearing part usually darker, wing glabrous. 2n = 52.** Native to Europe, mainly in the vicinity of mountains; widely planted for shelter and as an ornamental, frequently naturalized, in all Carpathian territories.

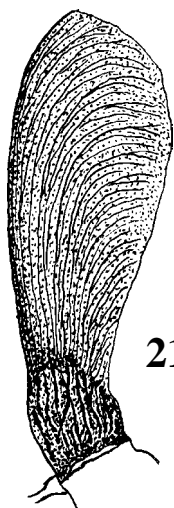
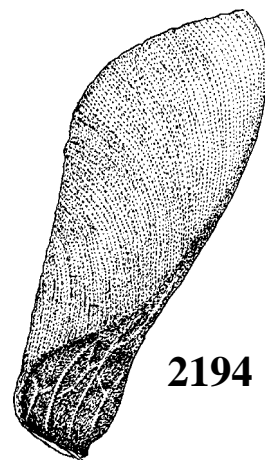
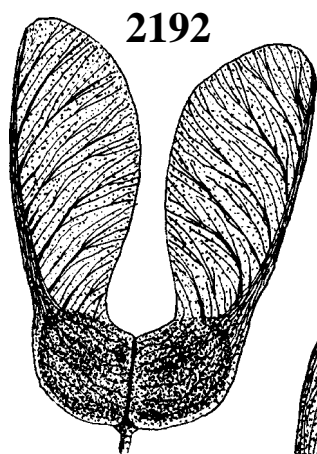
**2198. *Acer rubrum* L.** — Tree, up to 40 m high, twigs bare. **Fruits double samaras with acute wings, seed-bearing part slight flattish, distinct venous, slight reticulate, 18-24 x 7-8 mm (including wing). Surface reddish-brown, wings pale-brown. 2n = 64-104.** Originally growing in North America; in the Carpathians planted in parks as an interesting ornamental tree in many cvs.

**2199. *Acer rufinerve* Siebold et Zucc.** — Tree, up to 12 m high, young twigs pruinose, young leaves dense rusty-brown pubescent, 3-lobed. **Fruits double samaras with a large wings, 20-23 x 8-11 mm (including wing). Surface reddish-brown. Seeds spherical with small beak at the bottom, 3.3-3.5 x 3.1-3.3 mm. Surface rough wrinkly, dull, black, hilum reddish-brown.** Native to Japan; in the Carpathians rarely cultivated in parks as an attraction.

**2200. *Acer saccharinum* L., *A. dasycarpum* Ehrh., *A. eriocarpum* Michx.** — Tree, up to 40 m high, leaves deeply 5-lobed, silvery beneath. **Fruits double samaras with acute long wings, seed-bearing part strong flattish, 40-50 x 12-15 mm (including wing). Surface distinct venous, dull, dark-brown, wings pale-brown. 2n = 52.** Originally growing in North America; in the Carpathians often cultivated in parks in many cvs, sometimes planted in forests.

**2201. *Acer saccharophorum* C. Koch., *A. saccharum* Marsh.** — Tree, up to 40 m high with cracked grey bark. **Fruits double-achenes with acute wings, seed-bearing part semiglobose, slight flattish, 25-30 x 6-8 mm (including wing). Surface distinct venous, dark-brown, wings pale-brown. 2n = 26.** Originally growing in North America; in the Carpathians rarely cultivated for its beautiful autumn colours.

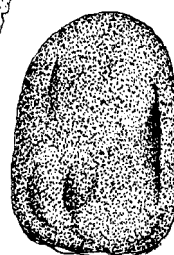




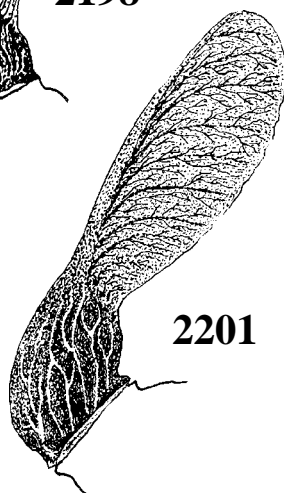
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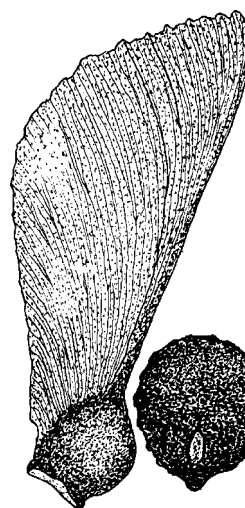
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2201



2200



2199



2197

**2202. *Acer semenovii*** Regel et Herd., *A. tataricum* var. *semenovii* Regel — Shrub or tree, up to 6 m high, leaves 3-5 cm, with narrow ovoid lobes, teeth-leaved on margins. **Fruits double samaras with acute wings, 28-32 x 10-12 mm (including wing). Seeds oblong ovoid, lateral compressed, 6.2-6.6 x 2.9-3.1 mm. Surface slight foveolate, dull, dark-purple.** Native to central Asia; in the Carpathians rarely cultivated in parks as an ornamental. Uk.

**2203. *Acer tataricum*** L. — Shrub or tree, up to 10 m high, twigs and buds reddish, bare. **Fruits double samaras with acute angle wings, seed-bearing part slight convex, prolonged, with distinct veins, 25-32 x 8-10 mm (including wing). Surface reddish- or greenish-brown, wings pale-brown. Seeds prolonged elliptic, usually with a deep furrow, 8-8.5 x 4-4.5 mm. Surface blackish. 2n = 26.** Native to Europe and the Caucasus, in light woodlands; sometimes planted as an ornamental in parks. Hu, Mo, Pl, Ro, Sk, Uk.

**2204. *Acer tegmentosum*** Maxim. — Tree, up to 12 m high, bark list greyish-green, leaves 3-lobed, sometimes with 2 small basal lobes, broad triangular. **Fruits double winged samaras, 24-28 x 8-10 mm (including wing). Surface reddish-brown. Seeds ellipsoid, lateral strong compressed, margin with an indistinct wing, 7-9 x 4-5 mm. Surface foveolate, slight lustrous, reddish-brown.** Native to China and Manchuria; in the Carpathians planted as an ornamental in parks and gardens. Sk, Uk.

**2205. *Acer trautvetteri*** Medv. — Tree, up to 15-20 m high, leaves greyish on reverse side, glossy, dark-green on upper part, 10-16 cm in diam. **Fruits double samaras, with subparallel wings, seed-bearing part roundish, lateral slight compressed, 40-50 x 12-14 mm (including wing). Surface veinous, glabrous, purple.** Native to the Caucasus; in the Carpathians very sporadically planted as an ornamental in parks.

**2206. *Negundo aceroides*** Moench, *Acer negundo* L., *A. fraxinifolium* Nutt. — Tree, up to 20 m high, twigs bare, considerably hoary. **Fruits double samaras, with acute wings, seed-bearing part strong flat-tish, lustreless, often with brown dots, veinous, 30-35 x 9-10 mm (including wing). Surface dirty-white, wings a little paler. 2n = 26.** Originally growing in North America; at present cultivated elsewhere as ornamental tree in parks and town planta-

tions in many cvs, occasionally naturalized. Hu, Mo, Pl, Ro, Sk, Uk.

## 105. SAPINDACEAE

**2207. *Koelreuteria paniculata*** Laxm. — Tree, up to 10 m high, corona broadly ovate up to globose. **Seeds obovate to globose, flattish on one side, convex on opposite side, apex obtuse, acuminate, base truncate with a small beak, 6.5-7.5 x 5.5-6.5 mm. Surface humpy, glabrous, lustrous, black, 1.2-1.4 x 3.4-3.8 mm. 2n = 22, 30.** Originally growing in eastern Asia; in the Carpathians often planted as a decorative tree in parks and town plantations, mostly at road- and street-sides.

**2208. *Xanthoceras sorbifolia*** Bge. — Tree, up to 8 m high, with erect and glabrous twigs. **Seeds globose or ellipsoid, ventral side constricted, made up of two or three flat areas, bordered with distinct ridges, apex side convex, 8-10 x 9.5-11 mm. Surface faint reticulate, slight lustrous, black.** Originally growing in northern China; introduced and cultivated in Europe, inclusive the Carpathians, as decorative tree in parks.

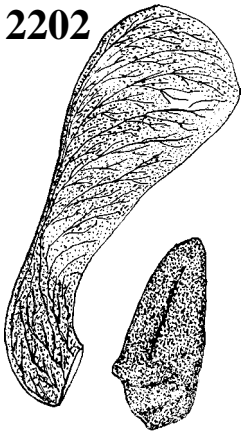
## 106. HIPPOCASTANACEAE

**2209. *Aesculus glabra*** Willd. — Tree, up to 10 m high. **Fruits nuts, obovoid to globose, slight flat-tish (poisonous), radicular lobe visible as a low, emerging ridge, hilum about 1 cm in diam., 15-27 x 15-23 mm. Surface glabrous, lustrous, smooth, reddish-brown, dirty-white, circular. 2n = 40.** Originally growing in North America; in the Carpathians rarely planted as an ornamental for the attractive flowers.

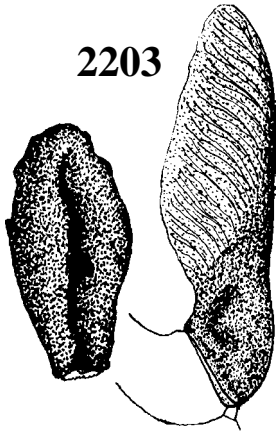
**2210. *Aesculus hippocastanum*** L., *Hippocastanum vulgare* Gaertn. — Tree, up to 25 m high, twigs relatively rough, buds rough, up to 35 mm long, pitched, sticky. **Fruits nuts, transversal broad ellipsoid, radicular lobe ± visible as a low, broad dark ridge, hilum circular or elliptic, large, 34-48 x 25-37 mm. Surface lustrous or glossy, glabrous, smooth, reddish-brown, hilum pale. 2n = 40.** Native to southern Europe; commonly cultivated in parks, town plantations, alleys, naturalized mostly in hedges and thickets, throughout the Carpathians.

**2211. *Aesculus octandra*** Marsh., *Pavia lutea* Poir. — Tree, up to 30 m high, twigs ± saggy, buds non-sticky. **Fruits nuts, irregular globose, usually flat-tish on ventral side, radicular lobe visible as a low**

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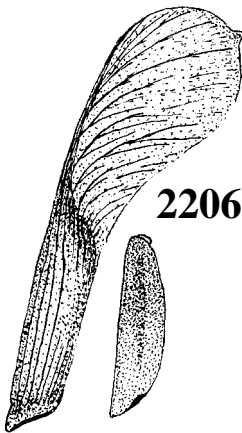
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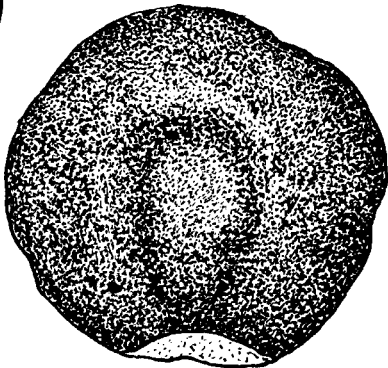
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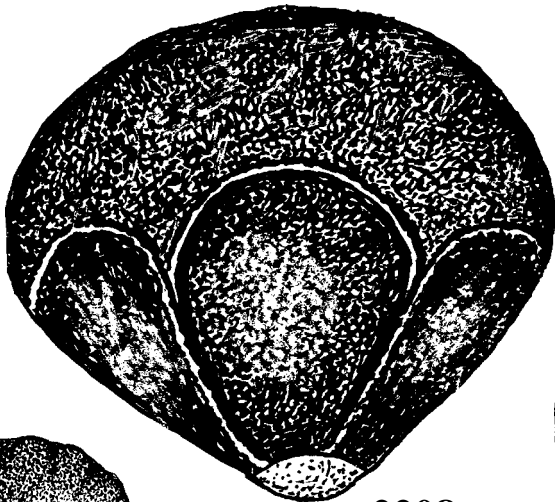
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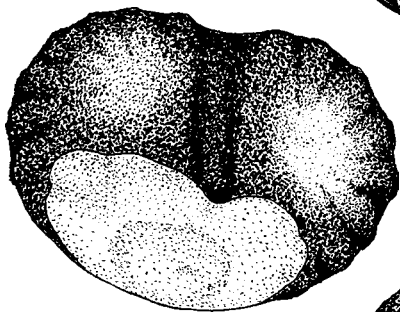
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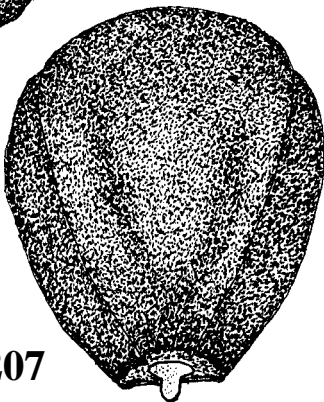
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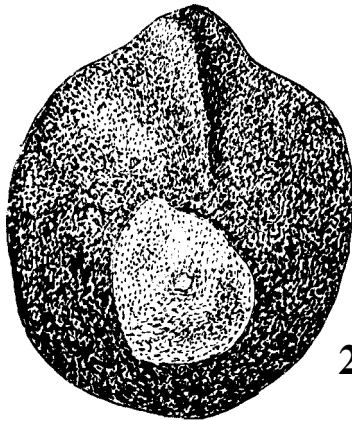
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2211



**ridge, 25-35 x 20-26 mm. Surface glossy, glabrous, smooth, dark reddish-brown. 2n = 40.** Originally growing in North America; in the Carpathians rarely planted in parks, alleys and orchards.

**2212. *Aesculus parviflora* Walt., *Pavia alba* Poir.** – Shrub, up to 4 m high, with narrowly conical non-sticky buds. **Fruits nuts, ovoid or globose, dorsal side convex, furrowed, ventral side with ellipsoid flat hilum, 25-40 x 20-35 mm. Surface smooth, lustreless (old nuts) or lustrous (fresh nuts), reddish-brown. 2n = 40.** Native to North America; in the Carpathians rarely cultivated in parks, for its white flowers.

**2213. *Aesculus pavia* L., *Pavia rubra* Poir.** – Tree, up to 10 m high, buds non-sticky. **Fruits nuts, more or less globose, radicular lobe faint distinct as a low, broad ridge hilum circular or elliptical c. 1 cm in diam., 20-30 x 15-20 mm. Surface glossy, glabrous, smooth, blackish-brown, hilum colour sandy. 2n = 40.** Native to North America; seldom cultivated for nice red flowers as an ornamental in parks.

**2214. *Aesculus turbinata* Blume** – Tree, up to 30 m high, buds sticky, glossy. **Fruits nuts, undulated ellipsoid, radicular lobe visible as a low, narrow ridge, hilum takes c. 1/2 area of the seed, 23-27 x 26-35 mm. Surface slight reticulate, lustrous, glabrous, smooth, reddish-brown, hilum dark-smoked.** Originally growing in Japan and China; in the Carpathians very rarely cultivated as an ornamental in parks.

**2215. *Aesculus x carnea* Hayne, *Ae. rubicunda* Loisel.** – Tree, up to 25 m high, buds weakly sticky, twigs bare, hybrid (*Ae. hippocastanum* x *pavia*). **Fruits nuts, broad obovoid or irregular globose, radicular lobe a very weak visible ridge, 20-33 x 18-25 mm. Surface lustrous, smooth, glabrous, black. 2n = 80.** Rarely cultivated in parks and alleys, for its beautiful flowers as an ornamental. Hu, Mo, Ro, Sk, Uk.

## 107. BALSAMINACEAE

**2216. *Impatiens balfourii* Hook. fil., *I. mathildae* Chiov.** – Annual, glabrous, 40-80 cm high, stems simple or branched, leaves ovate-lanceolate. **Seeds ellipsoid or obovoid, with a longitudinal furrow on ventral side, 3.3-3.7 x 2-2.4 mm. Surface longitudinal fine furrowed, lustreless, dark-brown.** Originally spread from the Himalayas; in the Carpathians

cultivated for ornament in gardens and in flowerpots, locally naturalized in disturbed grounds and at wood margins.

**2217. *Impatiens balsamina* L., *Balsamina hortensis* DC.** – Annual, glabrous or downy, 20-60 cm high, stems simple. **Seeds globose, broad ellipsoid to obovoid, 2.5-3 x 2.2-2.6 mm. Surface dense reticulate, with disperse glossy, sparkle spots, dark-brown. 2n = 14.** Originally growing in south-eastern Asia; widely cultivated in gardens and occasionally naturalized long time ago. Hu, Mo, Ro, Sk, Uk.

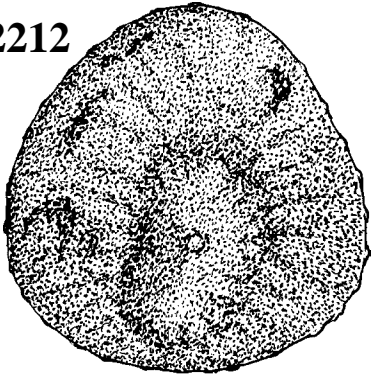
**2218. *Impatiens capensis* Meerb., *I. biflora* Walter** – Annual, glabrous, 20-150 cm high, leaves with 5-14 teeth on each side, often undulate. **Seeds oval or lanceolate, with 4 strong ribs, apex and bottom narrowed, 5-5.6 x 2.7-3.1 mm. Surface wrinkly or rough, lustreless, dark-brown, with some roundish and paler spots.** Originally growing in North America; in the Carpathians uniquely cultivated as an ornamental in gardens.

**2219. *Impatiens glandulifera* Royle, *I. roylei* Walp.** – Annual, bare, 1-2 m high, stem rough, mostly simple. **Seeds broad elliptic, obovoid to globose, apex obtuse, base constricted into a short beak, 3.8-4.3 x 3-3.3 mm. Surface fine waved from blisters, patchy raised and tubercle-like, brown to dark-brown. 2n = 18.** Originally growing in the Himalayas; cultivated in gardens, escaping along brooks, drains, trenches and riverbanks, throughout the Carpathians.

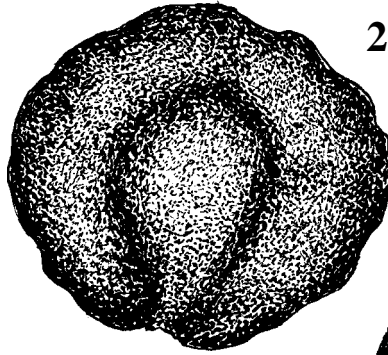
**2220. *Impatiens noli-tangere* L., *I. lutea* Lam.** – Annual, up to 100 cm high, stem erect, simple or ramified, leaves opposite. **Seeds obovoid, 4-angular in transverse section, 3.8-4.3 x 1.8-2.2 mm. Surface with four longitudinal acute to obtuse ridges, side faces smooth to rugose, usually with irregular ridges and knobs, red-brown. 2n = 20.** Native to Eurasian shady deciduous forests, coastal shrubberies, lowland forests, with wet, nutrients-rich soils; in all Carpathian territories.

**2221. *Impatiens parviflora* DC.** – Annual, glabrous, 10-100 cm high, stem simple or seldom ramified. **Seeds obovoid to obpyriform or elliptic, 4-5 x 2.2-2.6 mm. Surface dense, fine, longitudinal sulcate, single riblets are interrupted with small depressions, smooth, brown. 2n = 26.** Originally growing in northeastern Asia; in the Carpathians

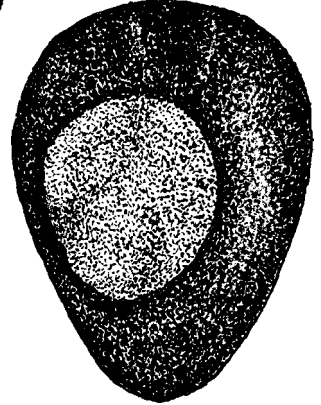
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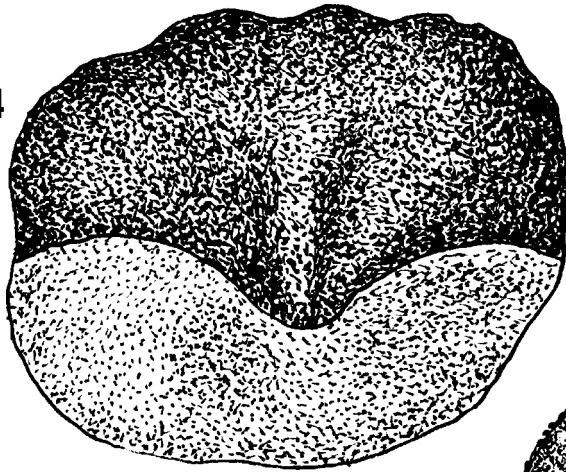
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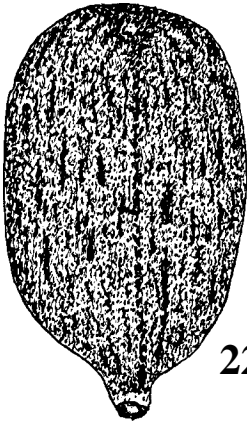
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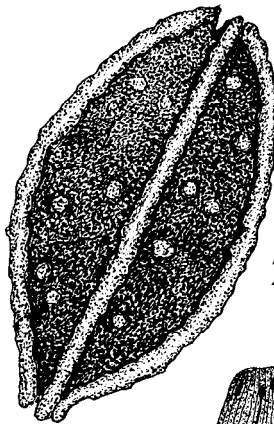
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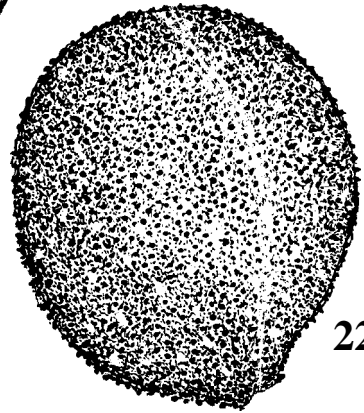
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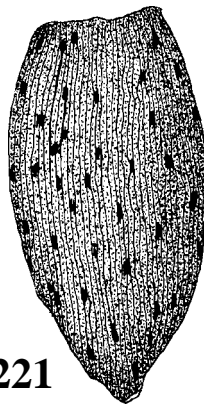
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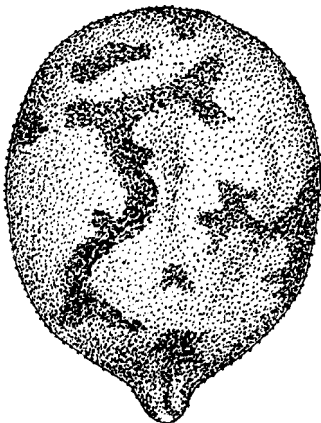
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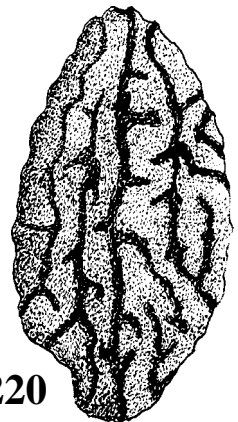
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2219



2220



hauling into woods, parks, gardens, waste places as weed, naturalized in wet stands.

### 108. CORNACEAE

**2222. *Cornus mas* L., *C. mascula* L.** – Shrub or small tree, up to 8 m high, twigs greyish-green, angular, hirsute. **Stones ellipsoid, acuminate at both ends, with two furrows leading from apex to 1/3 of the stone, on the bottom part with four ridges, 12-15 x 5-6 mm. Surface foveolate, lustreless, pinkish-yellow.**  $2n = 18$ . Native to European sunny, shrubby slopes, light oak forests with stony, often calcareous soils, in warmer areas; pulps of edible fruits is used in syrup manufacture. Hu, Mo, Pl, Ro, Sk, Uk.

**2223. *Cornus officinalis* Siebold et Zucc., *Macrocarpium officinale* Nakai** – Shrub up to 10 m high. **Stones prolonged ellipsoid, base and apex obtuse, 12-14 x 5-6 mm. Surface foveolate, lustreless, with four ridges at the bottom, two furrows in upper part, pinkish-yellow.** Originally growing in Japan; in the Carpathians very rarely cultivated as an ornamental in parks, pulp of fruits is used in syrup manufacture. Ro.

**2224. *Cornus racemosa* Lam., *C. paniculata* L'Hérit, *C. oblonga* hort.** – Shrub, up to 5 m high, twigs grey, thin, flowers white on red stalks. **Stones spherical, vertical slight compressed, slight rubbed, 3.8-4.2 mm in diam. Surface smooth, dull, pale-brown.** Native to North America; in the Carpathians rarely planted in parks and gardens as ornamental.

**2225. *Cornus suecica* L.** – Small shrub, 10-30 cm high, with ovate leaves and small blackish-red flowers. **Stones broad ovoid, slight flattish, with two lateral furrows, apex obtuse, constricted at base, 3-3.5 x 2.6-3 mm. Surface smooth, sandy.**  $2n = 22$ . Native to north Europe, Asia and North America, in moss carpet forests, shrubberies, at peatbog edges, calcifuge. Pl.

**2226. *Swida alba* L., *Cornus alba* L., *C. tatarica* Mill., *C. purpurea* Tausch** – Shrub, up to 3 m high, twigs dark-red. **Stones horizontal prolonged ellipsoid, strong flattish, apex and base obtuse and acuminate with 8 conspicuous ridges and grooves leading from the apex to the base, 3.2-3.8 x 4-5 mm. Surface smooth, ash-grey, brownish, black.**  $2n = 22$ . Originally growing in northern Asia; in

Europe, inclusive the Carpathians, cultivated as ornamental in parks, occasionally escaping. Hu, Mo, Ro, Sk, Uk.

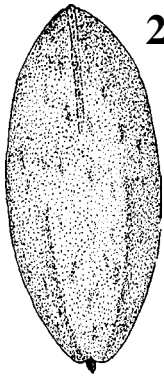
**2227. *Swida alternifolia* L.** – Tree or shrub, up to 8 m high, with spreading, storey-formed corona, leaves at base mostly cuneiformly narrowed, appressedly hirsute and greyish, 7-12 cm long, fruits 6-8 mm, blue-black on red stalks. **Stones  $\pm$  roundish or slight compressed, 4.4-5 mm in diam. Surface with some vein-furrows, smooth, lustreless, yellowish or greenish-brown.** Native to North America; in the Carpathians rarely planted as an ornamental in parks.

**2228. *Swida australis* (C. A. May.) Pojark., *Cornus australis* C. A. Mey., *Thelycrania australis* (C. A. Mey.) Sandre** – Shrub, up to 2-4 m high, young twigs green, hirsute, brownish later on. **Stones spherical, 4-6 mm in diam. Surface smooth, with 8 longitudinal furrows, dull, greyish-brown.**  $2n = 32$ . Native to Eurasia, along forest margins, cut-over areas, shrubby pastures; in the Carpathians often cultivated in parks and gardens.

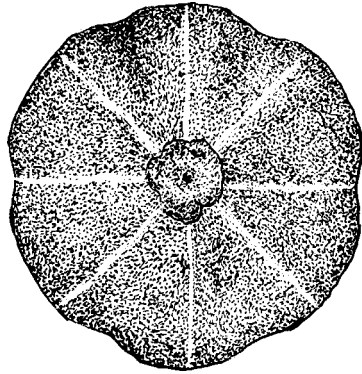
**2229. *Swida canadensis* (L.)** – Small herbaceous plant. **Stones obovoid convexo-convex with a shallow longitudinal furrow at the ventral side, 2.4-2.8 x 1.8-2 mm. Surface smooth, dull, sandy.** Native to North America, on spongy forest soils; in the Carpathians very rarely cultivated in gardens as an ornamental.

**2230. *Swida kousa* Hance, *Dendrobenthamia japonica* (Siebold et Zucc.) Hutchins** – Tree, up to 7 m high, leaves elliptic-ovate, acuminate, 5-9 cm long. **Stones irregular shaped, mostly obovoid with some depressions, 6-7 x 4.5-5.5 mm. Surface smooth, lustreless, whitish.** Native to Japan; in the Carpathians rarely planted as an ornamental in gardens, parks and town verdure.

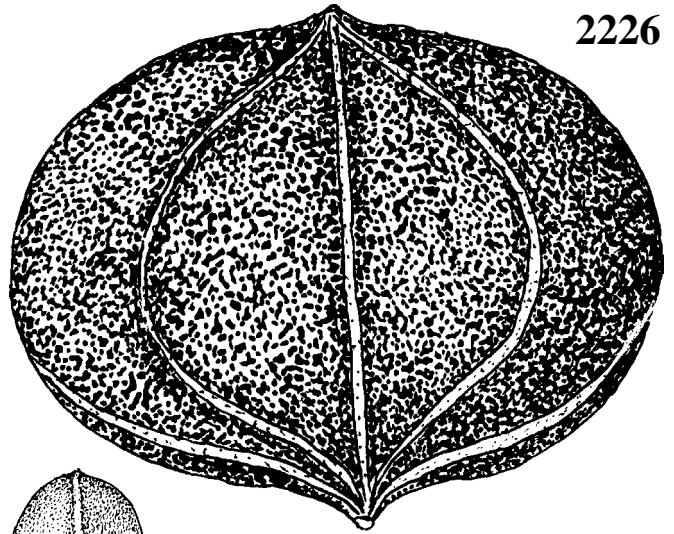
**2231. *Swida sanguinea* (L.) Opiz, *Cornus sanguinea* L.** – Shrub, up to 3 m high, twigs switched, downy, dark-purple later on. **Stones broad ovoid to globose, apex and base obtuse, 4-5 x 4.5-5.5 mm. Surface smooth, dull, with 8 conspicuous longitudinal ridges and grooves leading from the apex to the base, transverse section subcircular, pale-brown.**  $2n = 22$ . Native to southeastern Europe, in deciduous woods, forests edges, coastal shrubberies, overgrown slopes, rocks, stone-pits. Hu, Mo, Pl, Ro, Sk, Uk.



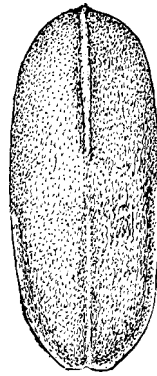
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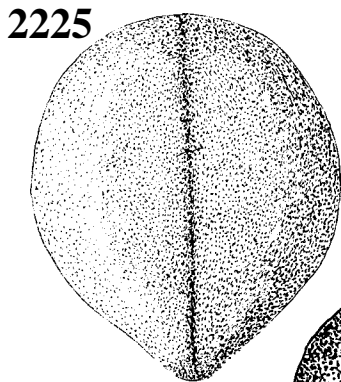
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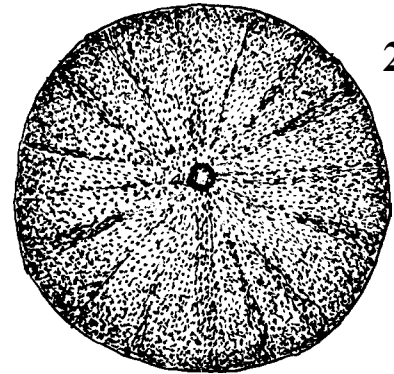
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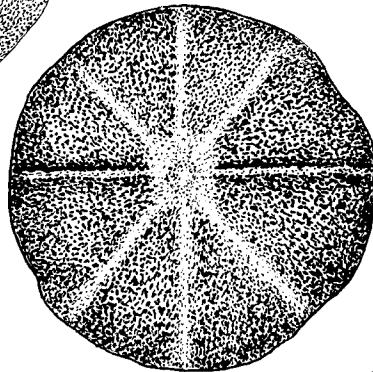
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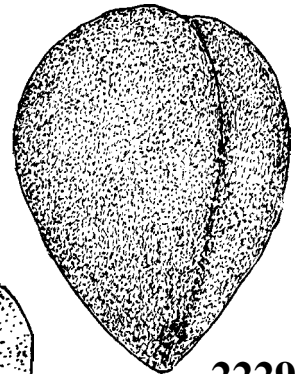
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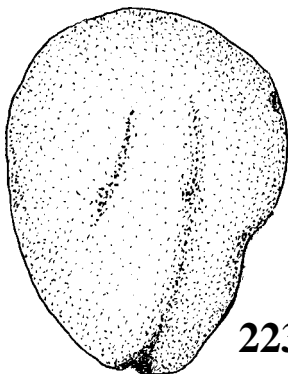
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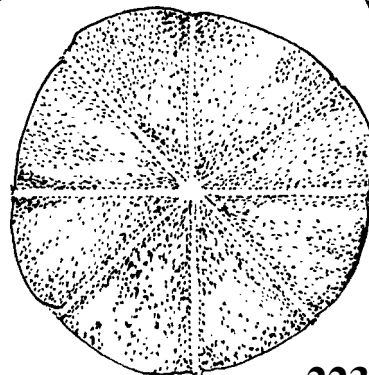
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2231

**2232. *Swida stolonifera*** (Michx.) Rydbg., *Cornus sericea* L., *Swida sericea* (L. em. Murray) Holub — Shrub, up to 2.5 m high, with dark-red twigs and with numerous underground and ground shoots. **Stones ellipsoid, apex acuminate, base truncate with small rounded hilum and 8 conspicuous ridges and grooves, 2.5-3.5 x 4-5 mm. Surface smooth, lustreless, grey. 2n = 22.** Originally spread from North America; in the Carpathians rarely cultivated in parks and town green. Hu, Mo, Pl, Ro, Sk, Uk.

**2233. *Cynoxylon floridum*** (L.) Britton et Shafer, *Cornus florida* L. — Shrub or tree, up to 10 m high, twigs green, bare. **Stones prolonged obovoid, with 2 furrows leading from the apex up to 1/3 of the seed and 2 more distinct furrows leading up to the base, 8-10 x 4-6 mm. Surface foveolate, lustreless, violet-white. 2n = 22.** Originally growing in North America, prefers moist, rich soils; in the Carpathians rarely cultivated as a decorative shrubs, mostly in parks.

#### 109. AUCUBACEAE

**2234. *Aucuba japonica*** Thunb. — Shrub, up to 5 m high, with thick, oval, forked green twigs. **Stones ellipsoid, 9-12 x 5-7 mm. Surface deep or shallow furrowed and wrinkly, dull, black.** Originally growing in Japan; in the warmer parts of Europe, including the Carpathians, cultivated as an ornamental in parks, gardens and cemeteries, in many cvs.

#### 110. DAVIDIACEAE

**2235. *Davidia involucrata*** Baill. — Tree, pyramidal corona up to 20 m high, with deciduous leaves. **Fruits drupe with 3-5 seeds; stones obovoid, 27-30 x 16-18 mm. Surface deep, irregular longitudinal-furrowed, lustreless, reddish-brown.** Native to China; in the Carpathians very squeamish, very rarely planted in the warmest areas as spectacular tree, mostly in botanical gardens.

#### 111. ARALIACEAE

**2236. *Hedera helix*** L. — Woody liana, up to 30 m high, creeping or climbing with numerous sticky roots, young twigs and inflorescence pubescent. **Seeds stone-like, ellipsoid to obovoid, sectorial, planoconvex, ruminant ridges large, hilum basal, inconspicuous, sometimes dark, 4.2-5 x 3-3.6 mm. Surface dull, glabrous, strong ruminant, yellowish-brown. 2n = 48.** Native to Eurasian woodlands as a covering and ornamental plant; throughout the Carpathians.

**2237. *Aralia chinensis*** L. — Shrub or tree, up to 2-8 m high, trunk a little thorny. **Seeds prolonged ellipsoid, flattish, apex convex, furrowed, ventral side acute, lateral sides flat, 2-2.3 x 1.4-1.6 mm. Surface fine reticulate, lustreless, pinkish-marble.** Originally growing in China; rarely cultivated in dwellings as an ornamental.

**2238. *Aralia elata*** (Miq.) Seem., *Dimorphanthus elatus* Miz., *D. mandshuricus* Max. — Shrub or tree, up to 15 m high, with a thorny trunk, leaves 40-100 cm. **Seeds ± ellipsoid, compressed lateral, dorsal side convex, longitudinal furrowed, ventral rooflike, ± flat, 2.3-2.7 x 1.3-1.5 mm. Surface lustreless, pale-brown.** Native to northeastern Asia; in the Carpathians rarely planted in parks.

**2239. *Aralia spinosa*** L. — Tree, up to 15 m high, with a very thorny trunk, fruits black, spherical, up to 6 mm in diam. **Seeds sectorial, ± ellipsoid, dorsal side longitudinal furrowed, convex, broader, ventral rooflike, narrowed, lateral compressed, 2.1-2.3 x 1.2-1.4 mm. Surface waved, lustreless, yellowish-white.** Native to North America; in the Carpathians very rarely planted in warmer areas in parks.

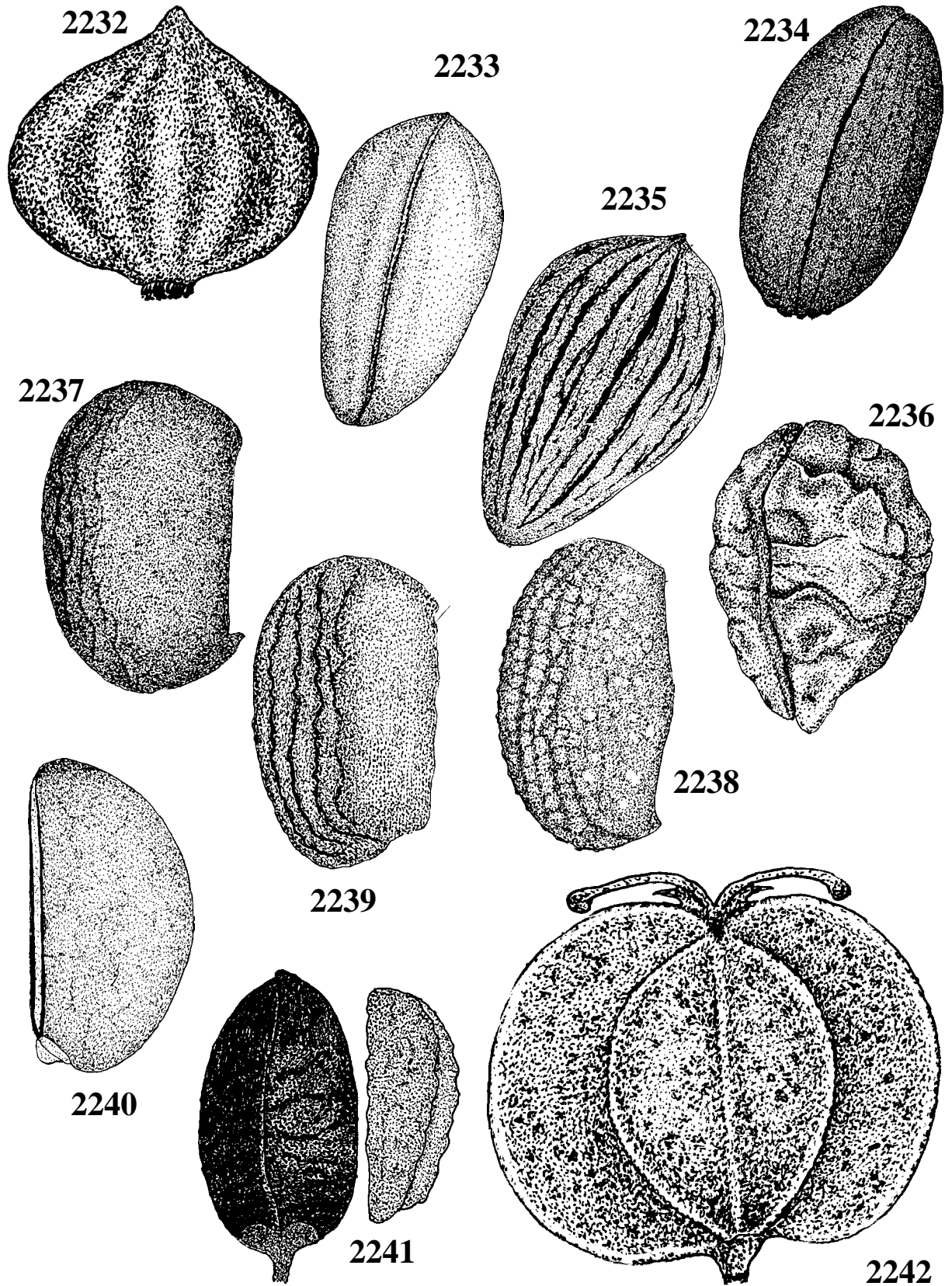
**2240. *Fatsia japonica*** (Thunb.) Decne et Planch, *Aralia japonica* Thunb., *A. sieboldii* hort. — Shrub or tree, up to 5 m high. **Seeds prolonged ellipsoid, sectorial, flattish, one side of the base truncate, 3.9-4.3 x 2-2.3 mm. Surface smooth, fine reticulate, lustreless, olive-flavescent.** Originally growing in Japan; in the Carpathians rarely cultivated for ornament outside, mostly in greenhouses or dwellings.

**2241. *Acanthopanax henryi*** (Oliver) Harm — Shrub, up to 3 m high, twigs roughly pubescent, bare later on, slightly rough, light yellowish-grey. **Seeds crescent-shaped, strong compressed, 8.5-9.5 x 3.6-4 mm. Surface smooth to slight foveolate, lustreless, whitish or pale-brown.** Native to central China; in the Carpathians rarely cultivated in parks and gardens as decorative.

#### 112. HYDROCOTYLACEAE

**2242. *Hydrocotyle vulgaris*** — Perennial, stems thin, decumbent, rooting down, 10-40 cm high. **Fruits achenes, narrow elliptic, lateral view semicircular, cordiform on the base, ventral side flat, 1.8-2.1 x 2.2-2.6 mm. Surface dull, glabrous, with five narrow ridges, pustulate, pale orange-yellow, pustules reddish. 2n = 96.** Native to Europe, in





mosses, red beds, marshes, damp meadows, on non-calcareous clay soils. Br, Hu, Pl, Sk, Uk.

**2243. *Bowlesia incana*** Ruiz et Pavón — Annual, procumbent, slender, with scattered starlike hairs, stems 10-50 cm high, forkedly ramified. **Fruits achenes, obovoid ellipsoid to globose, apex obtuse, base narrowed, 2-2.4 x 1.5-1.7 mm. Surface dense verrucose, dull, pale to dark-brown. 2n = 16, 32.** Originally growing in North America, rarely hauling into the Carpathians.

### 113. APIACEAE

**2244. *Sanicula europaea*** L. — Perennial, up to 40 cm high, with long-stalked, palmately lobed radical leaves. **Fruits polachenarium, ellipsoid to broad ellipsoid, ± flat, dorsoventral flattish, dense spiny, spines 1.5-2 mm long, hooked, stylopodium inconspicuous, 3-3.5 x 2.2-2.7 mm (with spines). Dorsal surface dull, glabrous, scaly in the bottom part, ventral surface smooth, flat, dark-brown. 2n = 16.** Native to Eurasia and north Africa, in forests and shaded areas, on sand-dunes; throughout the Carpathians.

**2245. *Astrantia major*** L. — Perennial, stems erect with 1-2 leaves, poorly branched in upper part. **Fruits polachenarium, ellipsoid, slight dorsoventral flattish, ventral side flat, style longer than the calyx-teeth, 6.2-6.8 x 2.2-2.6 mm. Dorsal surface dull, glabrous, with five ridges of connate scales, valliculae narrow, ventral surface smooth, with two visible vittae, light yellowish. 2n = 28.** Native to Europe, in shady forests, shrubberies and mountain plains; in all Carpathian territories.

**2246. *Hacquetia epipactis*** (Scop.) DC., *Astrantia epipactis* Scop. — Perennial, stem 1-2, glabrous, up to 25 cm high. **Fruits polachenarium, ovoid, dorsoventral flattish, convex with broad ridges on dorsal side, ventral side more or less flat with a marked pale ridge, 3.5-4 x 1.8-2.2 mm. Surface smooth, brown, ridges reddish-brown. 2n = 16.** Native to the East Alps and the North Carpathians, in light, humous and lowland forests with basic soils. Pl, Ro (?), Sk.

**2247. *Eryngium alpinum*** L. — Perennial, stem 30-70 cm, erect, unbranched, basal leaves persistent, soft, fruit dense scaly. **Fruits polachenarium, obovoid, dorsal side convex, with 3 scaly rows in the bottom part and 3 spines in the upper part, ventral side flat or slight concave, 7.5-8.5 x 3-3.6 mm. Dorsal surface longitudinal furrowed,**

**ventral smooth.** Native to the higher mountains of Europe (Alps), in alpine meadows; in the Carpathians rarely cultivated as an ornamental in gardens.

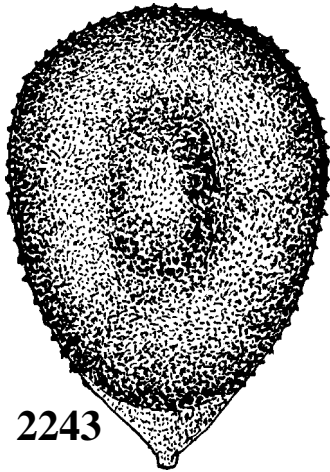
**2248. *Eryngium bourgatii*** Gouan — Perennial, stems up to 30-50 cm high, basal leaves palmate, stems leaves embraced. **Fruits polachenarium, obovoid, lateral strong compressed, apex with 3 thorns, bottom narrowed, 5.4-6 x 2.8-3.2 mm. Surface furrowed longitudinal, dull, dirty-whitish.** Native to Pyrenees, on stony slopes and gravel banks in montane and subalpine zones; in the Carpathians cultivated in rock-gardens as an ornamental.

**2249. *Eryngium campestre*** L., *E. vulgare* Lam. — Perennial, stem 30-70 cm high, erect, ramified into globose shape in the upper 2/3. **Fruits polachenarium, ellipsoid to obovoid, slight dorsoventral flattish, calyx-teeth 2-4 mm, 6-8 x 2.7-3.3 mm (with teeth). Dorsal surface dense scaly, scales membranous, whitish, ventral surface flat, smooth, yellowish-white. 2n = 28.** Native to European dry pastures, fallows, stony, steppe slopes and boundaries; throughout the Carpathians.

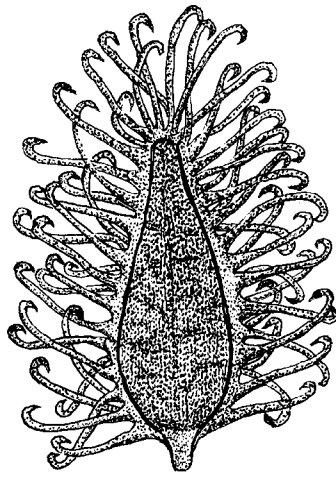
**2250. *Eryngium giganteum*** M. Bieb. — Biennial, stems up to 1 m high, branched above, stem leaves broad cordiformed, notched with long spines at margins. **Fruits polachenarium, obovoid, strong compressed lateral, apex with 3 spines, narrowed bottom truncate, 6-7.2 x 2.5-3 mm. Surface with some rows of blunt excrescent, dull, pale-brown.** Native to Caucasus, on deposits of mountain rivers in subalpine zones, on limestones; in the Carpathians cultivated in gardens and rock-gardens as ornamental and as material for dry bouquets.

**2251. *Eryngium maritimum*** L. — Biennial up to perennial, robust, up to 30-40 cm high, stems branched, basal leaves broad and spiny. **Fruits polachenarium, ellipsoid, dorsal side convex, with dispersed smaller thorns, ventral side ± flat, 3 thorns at the apex, 10-15 x 4.5-5 mm. Dorsal side surface brown, ventral side smooth, pale-brown. 2n = 16.** Native to sandy banks, of the Baltic and the Mediterranean areas. Mo, Pl, Ro, Uk.

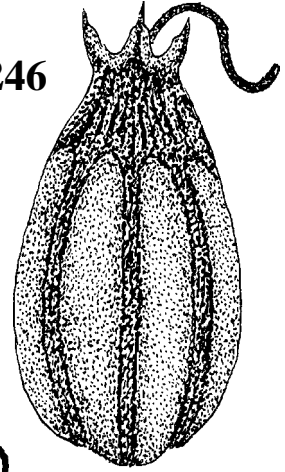
**2252. *Eryngium planum*** L. — Perennial, stem 30-100 cm high, erect, little ramified in the upper 1/3. **Fruits polachenarium, ellipsoid to obovoid, dorsoventral flattish, with c. 3 mm long calyx-teeth, 6-7 x 2-2.5 mm (with teeth). Dorsal surface scarce scaly, scales membranous, whitish, ventral surface**



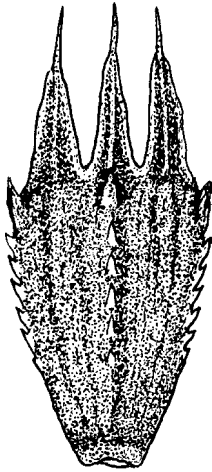
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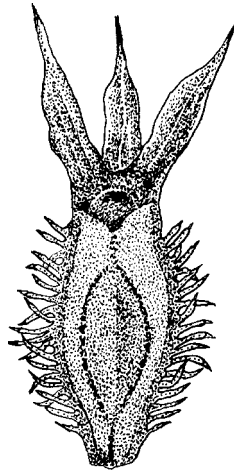
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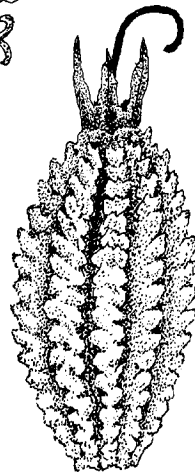
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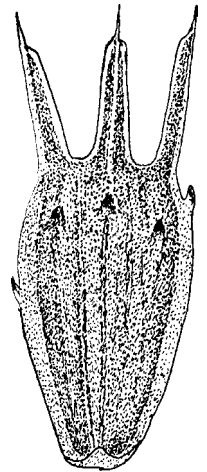
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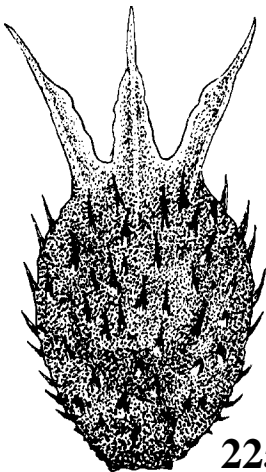
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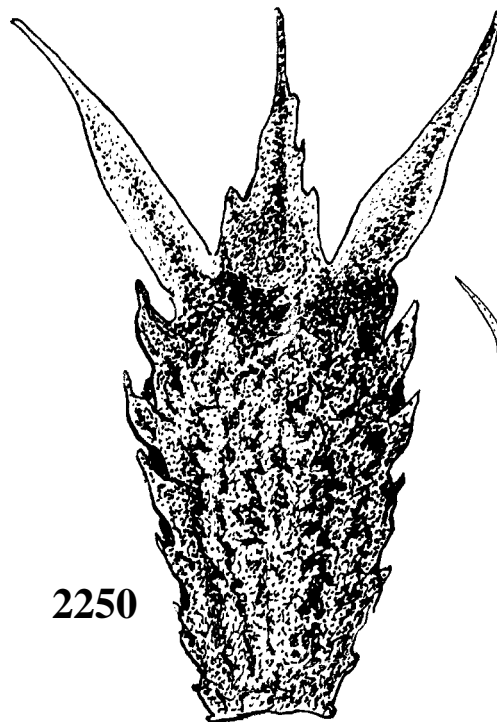
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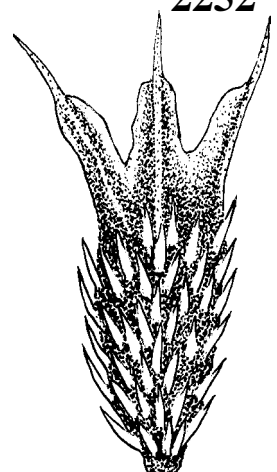
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2251



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2252

**yellowish-white. 2n = 16.** Native to Eurasia in the steppe pastures, boundaries, sandy dunes; throughout the Carpathians, rarely planted in gardens as an ornamental.

**2253. *Bupleurum affine*** Sadler, *B. gerardii* auct. non All. nec Jacq. — Annual, stem erect, slender, glaucous, 20-70 cm high. **Fruits polachenarium, prolonged ellipsoid, with 5 ridges on convex dorsal side and a groove in the middle of ventral side, 2-2.5 x 0.9-1.1 mm. Surface reticulate, dull, blackish-brown to black. 2n = 16.** Native to Eurasia, on sunny grassy and stony slopes, pastures, forest and rocky steppes. Hu, Mo, Ro, Sk, Uk.

**2254. *Bupleurum diversifolium*** Roch., *B. baldense* Baumg. — Perennial, stems glabrous, striate, up to 75 cm high, simple, ramified in upper part. **Fruits polachenarium, prolonged ellipsoid to ovoid, with five slight distinct ridges on dorsal convex side, ventral side flat with a groove in the middle, 1.5-1.9 x 0.7-0.9 mm. Surface dull, slight reticulate, dark-brown.** Native to Carpathians and the Balkan Peninsula, on dry open habitats, in scarce forests, rocky places and alpine pastures. Ro.

**2255. *Bupleurum falcatum*** L. — Perennial, stems up to 100 cm high, glabrous, mostly ramified. **Fruits polachenarium, prolonged ellipsoid, slight curved, dorsal side convex, with 5-filiform  $\pm$  winged ridges, ventral side flat, with a groove in the middle, 3-3.8 x 1.1-1.3 mm. Surface tuberculate, dull, shallow furrowed, dark-brown. 2n = 16.** Native to Eurasian steppe meadows and slopes, sunny rocks, shrubby places and light forests; in all Carpathian territories.

**2256. *Bupleurum longifolium*** L. — Perennial, stems 30-100 cm high, glabrous, erect, stout, often violet, branched. **Fruits polachenarium, prolonged ellipsoid, ventral side flat, with a distinct longitudinal groove, 3.8-4.6 x 1.2-1.5 mm. Dorsal surface with five ridges, dense tuberculate, red- to dark-brown. 2n = 16.** Native to European deciduous, humous forests, shrubby slopes; throughout the Carpathians.

**2257. *Bupleurum pachnospermum*** Pančič., *B. commutatum* auct. non Boiss et Bal. — Annual, stems up to 80 cm high, branched above, twigs patent, arched. **Fruits polachenarium, oblong ellipsoid, convex on dorsal side, with longitudinal and lateral ribs, with or without indistinct shallow furrow between the ribs, ventral side flat, with longitu-**

**dinal furrow, 4.1-4.7 x 1.4-1.7 mm. Surface very fine longitudinal, shallow furrowed, dull, dark-brown.** Native to Eurasia and North America, on grassy rocks, in subalpine and alpine zones, in calcareous stands. Hu, Ro, Uk.

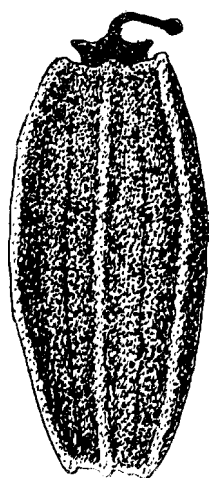
**2258. *Bupleurum praealtum*** L., *B. junceum* L. — Annual, stems erect, up to 1 m high, branched in the upper part. **Fruits polachenarium, prolonged ellipsoid, dorsal convex side with filiform ridges, ventral side flat with a groove in the middle, 4-4.8 x 1.5-1.9 mm. Surface dull, waved, dark to black-brown. 2n = 16.** Native to European light forests, sunny shrubberies and vineyards. Hu, Ro, Sk.

**2259. *Bupleurum ranunculoides*** L., *B. petraeum* auct. non L. — Perennial, stems erect, simple, 5-50 cm high. **Fruits polachenarium, prolonged ellipsoid, dorsal convex side with 5 prominent or narrow winged ridges, ventral side flat with a distinct groove in the middle, 2.7-3.3 x 1.1-1.3 mm. Surface fine waved, dull, shallow furrowed, dark-brown. 2n = 42.** Native to Eurasian mountain meadows and plains. Hu, Pl, Ro, Sk, Uk.

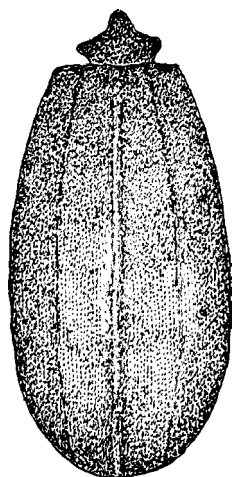
**2260. *Bupleurum rotundifolium*** L. — Annual, stems glabrous, erect, 10-60 cm high, sometimes reddish, ramified in the upper part. **Fruits polachenarium, prolonged ovoid to ellipsoid, dorsoventral flattish, ventral side with a longitudinal groove, 2.6-3.2 x 1.2-1.4 mm. Dorsal side surface with 5 faint undulated ridges, smooth to sulcate, blackish-brown. 2n = 16.** Native to Eurasia, as weed on fields, in warmer areas of lowlands; in all Carpathian territories.

**2261. *Bupleurum tenuissimum*** L. — Annual, stems erect, greyish-green, up to 70 cm high, sometimes ramified at base. **Fruits polachenarium, ovoid to globose, with five undulated ridges on dorsal side and a groove in the middle of the ventral side, 1.8-2.2 x 1.5-1.8 mm. Surface tuberculate, dull, grey to nut-brown. 2n = 16.** Native to Eurasia, on saline drying loamy soils. Hu, Mo, Pl, Ro, Sk, Uk.

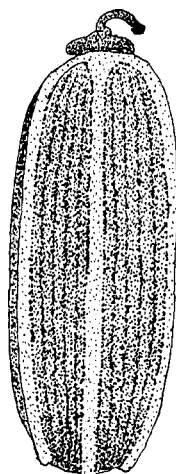
**2262. *Trinia glauca*** (L.) Dumort., *Pimpinella glauca* L. — Biennial, stems greyish-green, glabrous, erect, 10-40 cm high, striate, branched. **Fruits polachenarium, broad ellipsoid, dorsal convex side with five prominent ridges, ventral side with a longitudinal groove, 3-3.6 x 1.4-1.8 mm. Surface glabrous, scabrid, greenish- to dark-brown. 2n = 18.** Native to European dry slopes, stony



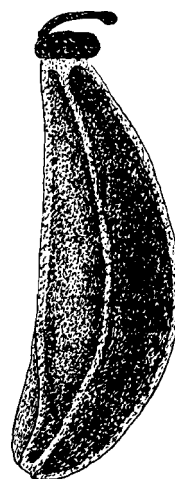
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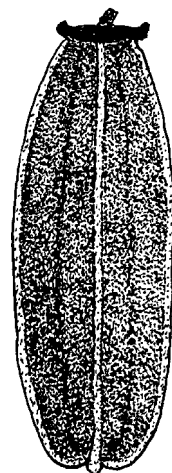
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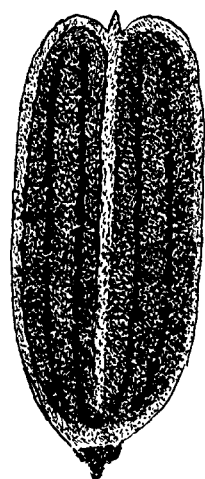
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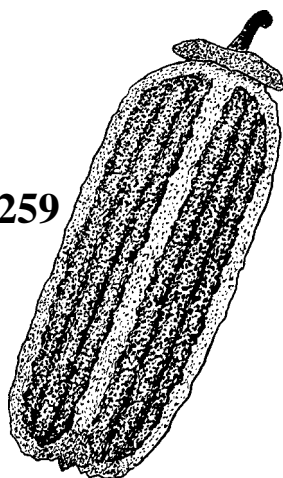


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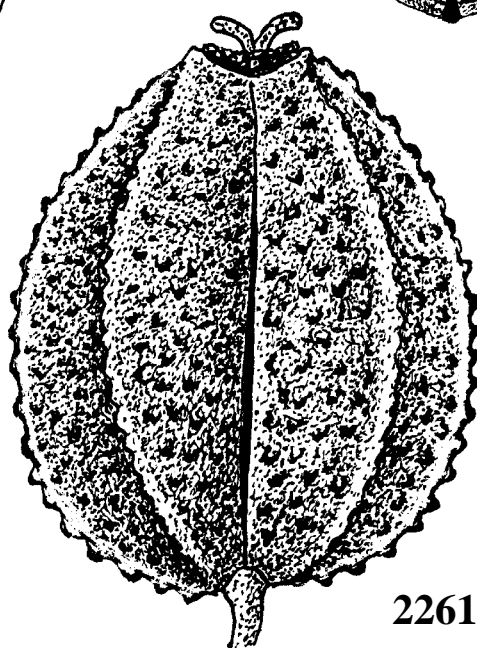
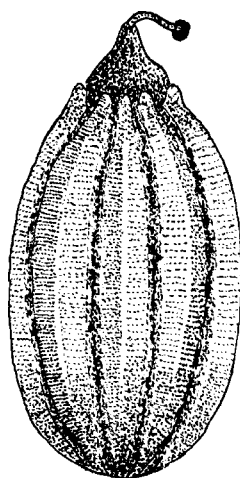
2259



2260



2262



2261

slants and vineyards with basic sandy soils. Hu, Ro, Sk, Uk.

**2263. *Trinia ucrainica*** Schischkin, *T. ramosissima* (Fisch.) Koch, *T. kitaibelii* M. Bieb. — Annual up to perennial, stems erect, up to 1 m high, glabrous, ramified. **Fruits polachenarium, ovoid, dorsal side with five blunt, expressive ridges and broad furrows, base truncate, ventral side flat, with a longitudinal groove, 3-3.8 x 1.7-2 mm. Surface smooth, glabrous, straw pale-brown. 2n = 20.** Native to eastern Europe, on shrubby slopes with arid, basic to neutral, stony and loamy soils. Hu, Mo, Pl, Ro, Sk, Uk.

**2264. *Apium graveolens*** L., *A. dulce* Mill. — Biennial, very fragrant with a characteristic smell, bare, stems erect, up to 100 cm high, angular, branched. **Fruits polachenarium, elliptic to ovate, style minute, 1.3-1.6 x 0.8-1 mm. Dorsal side surface with five narrow, usually undulated ridges, valleculeae wider than the ridges, ventral side smooth, vittae hardly visible, brown, ridges pale. 2n = 22.** Native to southwestern Europe; commonly cultivated as a vegetable or spice; in all Carpathian territories.

**2265. *Apium inundatum*** (L.) Rchb., *Heliosciadium inundatum* (L.) Koch — Perennial, up to 75 cm, usually partly or completely submerged, leaves pinnate, the lower leaves divided into filiform or linear lobes. **Fruits polachenarium, elliptic-oblong, lateral compressed, with 5 furrows and 6 ribs, 2.7-3 x 1.4-1.6 mm. 2n = 22.** Native to western Europe, extending eastwards to Sicilia, Poland and southern Sweden. Pl.

**2266. *Apium nodiflorum*** (L.) Lag., *Sium nodiflorum* L. — Perennial, stems up to 50 cm high, procumbent to ascendent, often ramified. **Fruits polachenarium, ovoid-oblong, with 5 procumbent and thick ridges on dorsal side, ventral side flat with a longitudinal groove, 2-2.3 x 1.9-2.1 mm. Surface waved, lustreless, brown. 2n = 22.** Native to western Europe, in wet places at brooks, ditches and ponds. Ro.

**2267. *Apium repens*** (Jacq.) Rchb., *Heliosciadium repens* (Jacq.) W. D. J. Koch, *Sium repens* Jacq. — Perennial, plant low-growing, stems prostrate, rooting down at nodules, 10-30 cm long, up to 100 cm long when floating on water. **Fruits polachenarium, elliptic to ovate, with five primary and four secondary ridges, and two on ventral side, 1-1.3 x**

**1.1-1.4 mm. Surface waved, lustrous, dark-brown. 2n = 22.** Native to central Europe, in waterlogged and swampy stands. Hu, Pl, Ro (?), Sk.

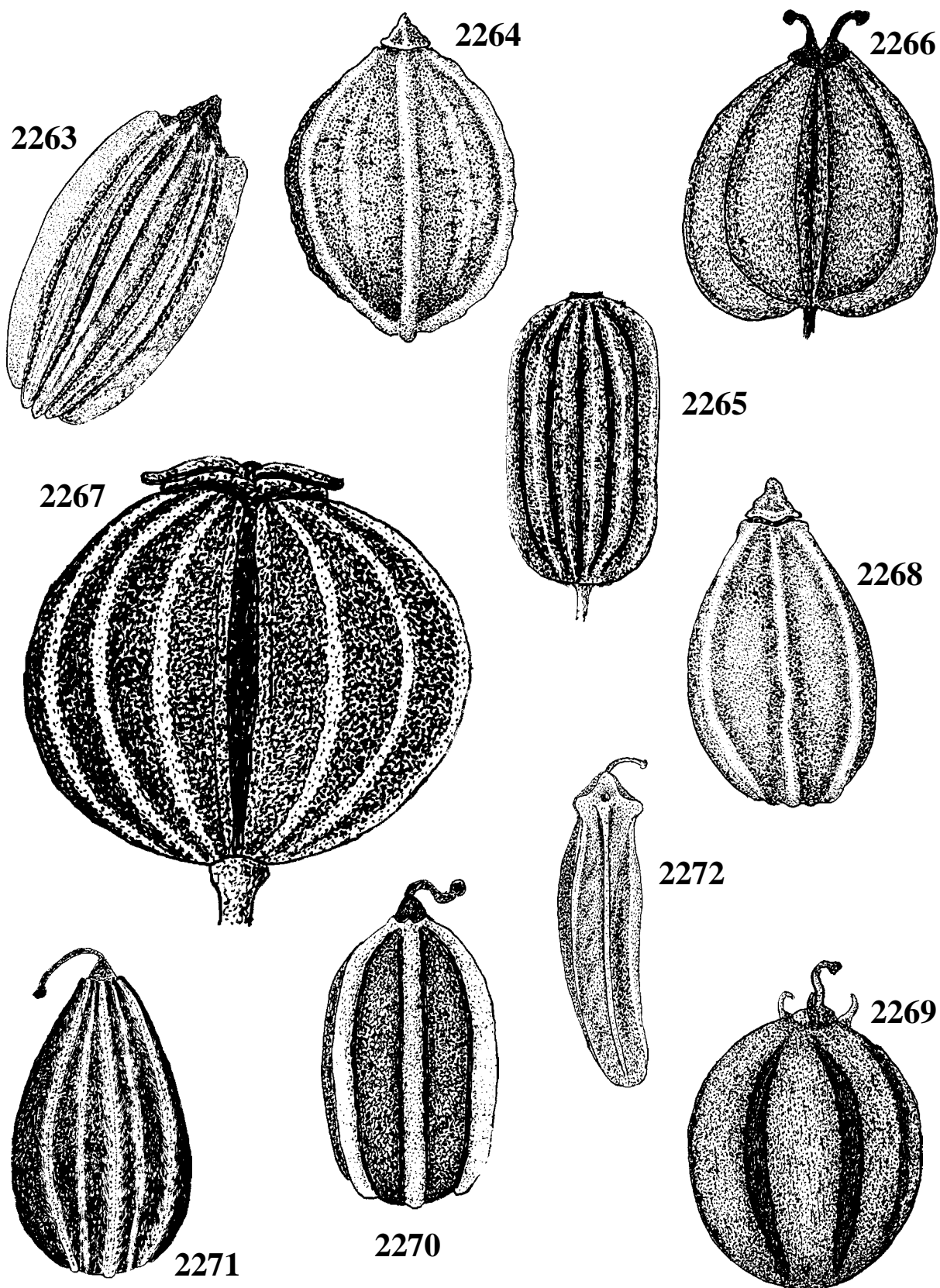
**2268. *Petroselinum crispum*** (Mill.) A. W. Hill, *P. hortense* Hoffm., *P. sativum* Hoffm. — Biennial, aromatic, bare, stems erect, fine grooved, hollow, 30-70 cm high, ramified. **Fruits polachenarium, broad ovoid, dorsoventral flattish, base with undulated margin, stylopodium conical, 2.3-2.9 x 1.2-1.4 mm. Dorsal surface dull, glabrous, with five distinct ridges. Ventral surface with visible vittae, ridges light-brown, valleculeae dark-brown. 2n = 22.** Native to southeastern Europe and western Asia, long time ago cultivated as a vegetable in some convar. or cvs; throughout the Carpathians.

**2269. *Cicuta virosa*** L. — Perennial, stems hollow, erect, 50-120 cm high, fine furrowed, ramified. **Fruits polachenarium, globose to ovoid, with thick ridges and narrow valleculeae on dorsal convex side, ventral side flat with a longitudinal vittae, 1.8-2.2 x 1.8-2.2 mm. Surface smooth or verrucose, dull, ridges light-brown, valleculeae red- to dark-brown. 2n = 22 (44).** Native to Eurasian muddy banks of stagnant waters, boundaries; throughout the Carpathians.

**2270. *Ammi majus*** L. — Annual, up to 30-100 cm high, stems simple, poorly branched in upper part. **Fruits polachenarium, elliptic to ovoid-oblong, ridges on dorsal convex side rather thick and prominent, lateral side flat with a longitudinal groove, 2-2.5 x 1.2-1.5 mm. Surface glabrous, valleculeae dark-brown, ridges pale. 2n = 22.** Native to Mediterranean, rarely dragging into the Carpathians, on sandy to loamy soils, waste places. Hu.

**2271. *Ammi visnaga*** (L.) Lam., *A. dilatatum* St.-Lag. — Biennial, stems erect, round, grooved, branched, up to 1 m high. **Fruits polachenarium, prolonged ovoid to elliptic, ridges c. 1 mm broad on dorsal convex side, ventral side with 3 longitudinal ridges, 2-2.5 x 1.3-1.6 mm. Surface valleculeae dark-brown, ridges pale.** Native to southern Europe, occasionally dragging to central Europe, in waste and depot places.

**2272. *Falcaria vulgaris*** Bernh., *F. rivini* Host, *F. sioides* (Wibel) Asch. — Annual, biennial up to perennial, stems erect, full, richly branched, 30-60 cm high. **Fruits polachenarium, narrow ellipsoid, dorsal side convex with ridges, ventral side flat with**



visible vittae, 3.6-4.2 x 0.8-1.1 mm. Surface dull, glabrous, vallecule red- to dark-brown, ridges light-brown.  $2n = 22$ . Native to Eurasian sunny slopes, dry pastures and boundaries of warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**2273. *Carum carvi* L.** – Biennial, bare plant, stems erect, 30-150 cm high, angular, little branched. **Fruits polachenarium, narrow ellipsoid, often curved in lateral view, dorsal side with five low and narrow ridges, ventral side flat with visible vittae, 4.5-5.5 x 1.3-1.7 mm. Surface vallecule red- to dark-brown, faint ribbed, lusterless, ridges light-brown.  $2n = 20$ , 22 (?).** Native to Eurasian moist meadows, pastures and boundaries; cultivated for its aromatic fruits used as spice; in all Carpathian territories.

**2274. *Bunium bulbocastanum* L., *Carum bulbocastanum* (L.) Koch** – Perennial, stems erect, 30-70 cm high, grooved, their upper part poorly branched. **Fruits polachenarium, narrow ellipsoid, dorsal side convex with five narrow ridges, ventral side flat with visible vittae, 3.4-4.2 x 1-1.2 mm. Surface dull, glabrous, vallecule dark-brown, ridges light-brown.  $2n = 22$ .** Native to western; rarely dragging into the Carpathians as a field and garden weed.

**2275. *Pimpinella anisum* L., *Anisum vulgare* Gaertn.** – Annual, fine pubescent, stems erect, 20-50 cm high, rounded, fine grooved, ramified above. **Fruits polachenarium, pyriform to ovoid, dorsoventral flattish, ridges on dorsal side, 4.4-5 x 2-2.4 mm. Surface dull, moderate hairy, vallecule henna to brown, ridges medium brown.  $2n = 18$ , 20.** Originally growing in southwestern Asia, long time ago cultivated as a spice in gardens; in all Carpathian territories.

**2276. *Pimpinella major* (L.) Huds., *P. magna* L.** – Perennial, glabrous or scattered downy plant, stems 40-100 cm high, erect, hollow, angular, grooved. **Fruits polachenarium, ellipsoid to ovoid, dorsoventral flattish, dorsal side with five ridges, vittae 2-3 in each vallecule and 2-4 on ventral side, 2.5-3.5 x 1.1-1.6 mm. Surface slight glittering, glabrous, brown.  $2n = 18$ , 20.** Native to Eurasian meadows, pastures, light edges of forests and shrubberies; in all Carpathian territories.

**2277. *Pimpinella nigra* Mill., *P. saxifraga* subsp. *nigra* (Mill.) Gaud.** – Perennial, stems 40-120 cm, roundish, fine grooved, greyish hirsute. **Fruits polachenarium, ellipsoid, with ribs on the dorsal**

**side, ventral side flat, with longitudinal furrow or rib, 2.6-3 x 1.2-1.4 mm. Surface mostly longitudinal wrinkly, lustreless, dark-brown.  $2n = 18$ .** Native to European warmest areas, on sunny slopes and steppe meadows, rare. Ro, Sk.

**2278. *Pimpinella peregrina* L.** – Biennial, stem single, up to 1 m high, bottom part hirsute, upper part glabrous, ramified. **Fruits polachenarium, ovate to ellipsoid, 2.5-3 x 1.4-1.6 mm. Surface very dense patent-hairy, greyish-brown.** Native to southern Europe, Asia Minor and northeastern Africa, at road edges, in scarce shrubberies and fallows. Ro, Uk.

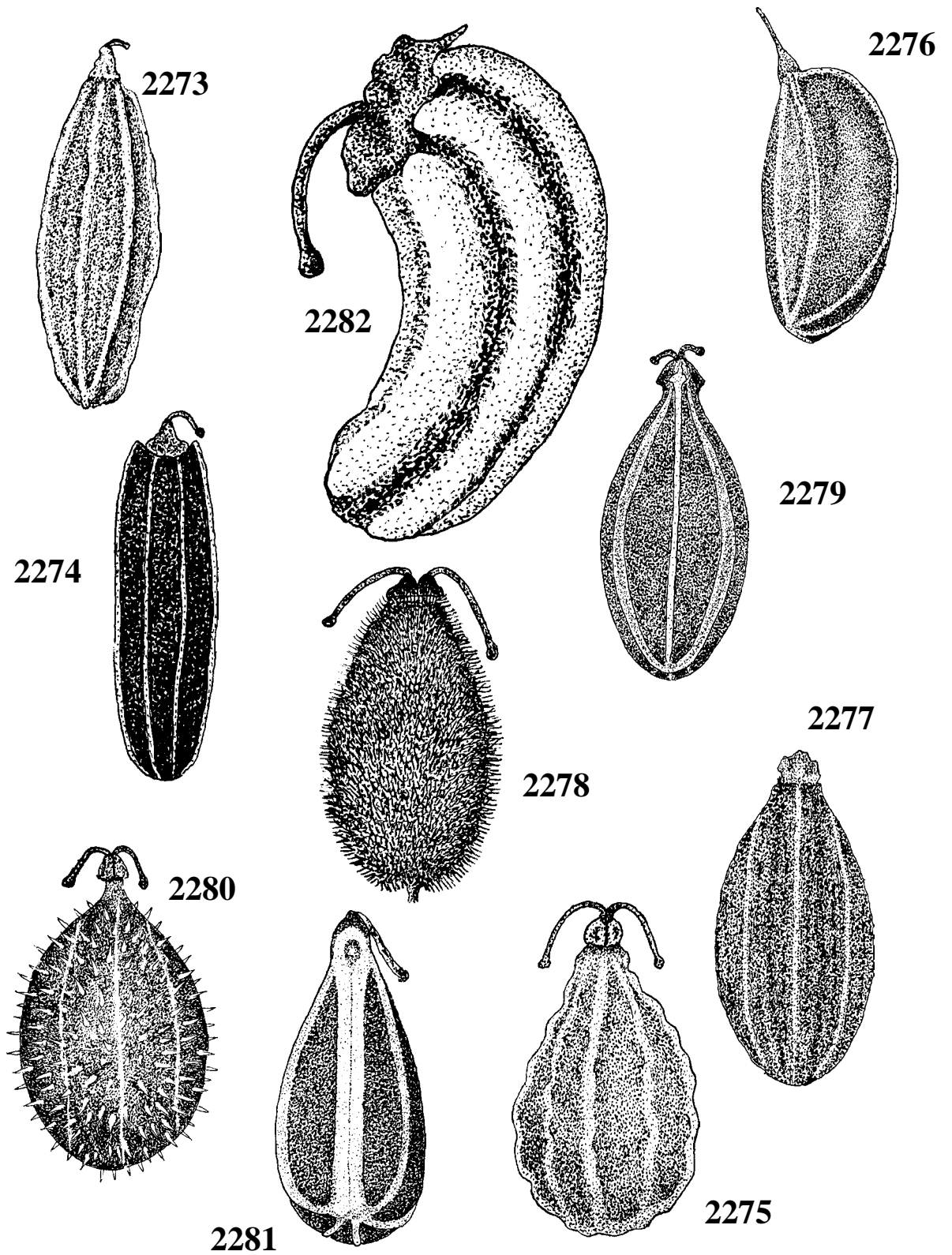
**2279. *Pimpinella saxifraga* L., *P. alpina* auct. non Host** – Perennial, stems 15-60 cm high, roundish, fine grooved, full, ramified. **Fruits polachenarium, elliptic to ovoid, dorsoventral flattish, at both ends narrowed, dorsal side convex with five ridges, ventral side flat, 2.2-2.6 x 0.9-1.3 mm. Surface wrinkly, dull, lustrous, dark-brown.  $2n = 36$  (40).** Native to Eurasian dry meadows and pastures, boundaries, sunny overgrown rocks and shrubberies; throughout the Carpathians.

**2280. *Pimpinella tragium* Vill.** – Perennial, stems up to 50 cm high, erect, much ramified. **Fruits polachenarium, ovoid to ellipsoid, with five indistinct ridges on dorsal side, ventral side flat, 1.6-2 x 0.9-1.1 mm. Surface wrinkly, scarce prickly, dark-brown.** Native to southern and eastern Europe, Asia and northern Africa, on rocky, stony slopes with calcareous soils. Mo, Ro, Uk.

**2281. *Aegopodium podagraria* L., *Ligusticum podagraria* (L.) Crantz** – Perennial, stems up to 1 m high, erect, hollow, angularly grooved, branched. **Fruits polachenarium, narrow ovoid, dorsoventral flattish, dorsal side convex with narrow ridges, ventral side flat with a white stripe, 3.5-4 x 1.4-1.6 mm. Surface dull, glabrous, ridges reddish- and vallecule dark-brown.  $2n = 22$ , 42, 44.** Native to Eurasian shady and wet shrubberies, forests, gardens, meadows and riverbanks. Hu, Mo, Pl, Ro, Sk, Uk.

**2282. *Sium latifolium* L.** – Perennial, stems erect, up to 150 cm high, little branched above, hollow, angularly grooved. **Fruits polachenarium, narrow obovoid, often curved in lateral view, dorsal side convex, with five conspicuous ridges, ventral side with visible vittae, 3.5-4.5 x 1.2-2 mm. Surface dull, glabrous, vallecule brown, ridges light-brown.**





**2n = 20.** Native to Eurasia, on banks of stagnant waters and reed swamps. Hu, Pl, Ro, Sk, Uk.

**2283. *Sium sisarum* L.** — Perennial, a plant very similar to *S. latifolium*. **Fruits polachenarium, prolonged narrow ellipsoid, with narrow ridges on dorsal side, ventral side flat, with a longitudinal furrow, 2.8-3.5 x 1-1.2 mm. Surface of ridges pale-, valleculeae dark- to blackish-brown. 2n = 20, 22.** Native to southeastern Europe, in the 11th and 16th centuries intensively cultivated in Europe for its edible roots and occasionally naturalized. Hu, Pl, Ro, Uk.

**2284. *Berula erecta* (Huds.) Coville, *Sium erectum* Huds., *S. angustifolium* L.** — Perennial, stems erect to ascendent, 20-100 cm high, fine grooved, hollow, branched. **Fruits polachenarium, globose or ovoid, dorsal side convex with five low and narrow ridges, ventral side flat without visible vittae, 1.6-2 x 1.3-1.5 mm. Surface dull, glabrous, faint granulate, brown. 2n = 18 (12, 20).** Native to Europe, in stagnant or slow-flowing waters, brooks, at boundaries. Hu, Mo, Pl, Ro, Sk, Uk.

**2285. *Crithmum maritimum* L.** — Perennial, stems erect to ascendent 20-25 cm high, striate, poorly ramified in upper part. **Fruits polachenarium, ovate-oblong, horizontal flattish, dorsal side convex with five faint ridges, ventral side flat with a longitudinal groove, basal part of style conical, 5-6 x 2.8-3.1 mm. Surface roughen, yellowish-white.** Native to the Mediterranean and British Isles, in stony and sandy stands, sea coasts or shingles. Pl, Uk.

**2286. *Physospermum cornubiense* (L.) DC., *P. danaa* (M. Bieb.) Schischk.** — Perennial, 50-120 cm high, nearly glabrous, stems striate, solid. **Fruits polachenarium, ellipsoid, dorsal side strong convex with 5 ribs, ventral side concave with a longitudinal furrow in the middle, 4-4.4 x 2.2-2.4 mm. Surface smooth, glossy, dark chocolate-brown.** Native to southern Europe, extending northwards to Hu, Ro, Uk.

**2287. *Seseli annuum* L., *S. coloratum* Ehrh.** — Annual or biennial, a pubescent or glabrous plant, stems erect, 10-100 cm high, stout, grooved, unbranched. **Fruits polachenarium, ovoid to ellipsoid, scarce compressed, dorsal side convex, ventral side flat, five ridges conspicuous, 2.3-2.7 x 1-1.3 mm. Surface glabrous or pubescent (fresh seed), lustreless, valleculeae dark-brown, ridges pale-brown. 2n = 16.** Native to Eurasian sunny,

grassy slopes and pastures, rocky steppes; in all Carpathian territories.

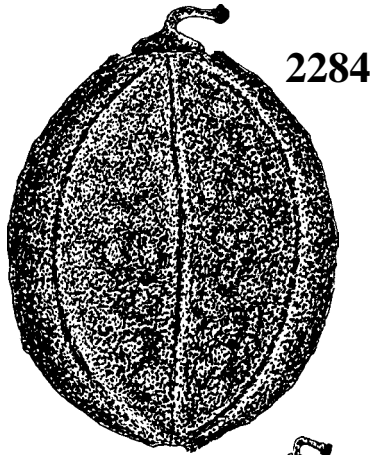
**2288. *Seseli austriacum* auct. non (Beck) Wohlf.:** Dostál, *S. osseum* subsp. *austriacum* auct. non (Beck) Thell.: Dostál — Biennial up to perennial, stems 30-120 cm high, erect, fine striate, rays 9-20. **Fruits polachenarium, ovoid, planoconvex, with 5 ribs on the dorsal side, 3-3.4 x 1.6-1.9 mm. Surface dense downy in youth, later on faint waved, dull, greyish-brown. 2n = 22.** Native to southeastern Europe, on dry, non-calcareous, stony or rocky stands. Sk.

**2289. *Seseli campestre* Besser, *S. gigas* Janka** — Stems up to 100 cm high, shelly grooved, much ramified, violetish. **Fruits polachenarium, prolonged ovoid with thick ridges on dorsal side, ventral side flat, 2.8-3.2 x 1.6-1.8 mm. Surface dense hirsute (fresh seeds), bare, later on light-brown.** Native to southeastern Europe and Asia Minor, on black soils, steppes and slopes, in chalky places, seldom as a weed of fields. Mo, Ro, Uk.

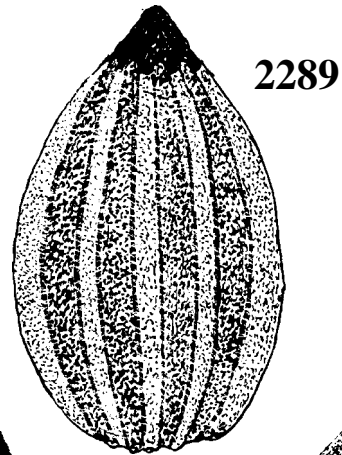
**2290. *Seseli gracile* Waldst. et Kit.** — Perennial, numerous stems, flexible, simple or forkedly ramified, up to 90 cm high. **Fruits polachenarium, prolonged ellipsoid, five ridges on dorsal side, ventral side flat, calyx-teeth broad triangular, 3.6-4 x 1.4-1.6 mm. Surface verrucose, dull, ridges pale-, valleculeae reddish-brown.** Native to southern Europe, on sunny coasts, in grassy, stony places with calcareous soils. Ro.

**2291. *Seseli hippomarathrum* Jacq.** — Perennial, stems erect 15-80 cm, rounded, glabrous, striate, dense leafy below, little branched above. **Fruits polachenarium, oblong-ovoid, dorsal side with five strong ridges, ventral side flat, apex calyx-teeth triangular, 3.7-4.5 x 1.8-2.5 mm. Surface of fresh seeds hairy, old seeds more or less bare, light-yellowish. 2n = 20.** Native to European sunny stony steppes and pastures of warmer areas. Au, Hu, Mo, Pl, Ro, Sk, Uk.

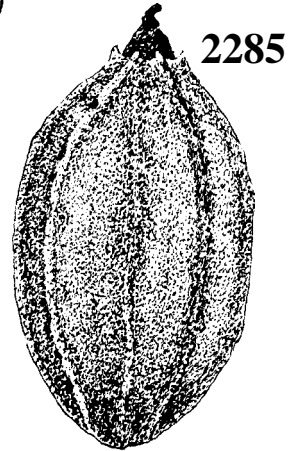
**2292. *Seseli osseum* Crantz em. Simonk., *S. elatum* L., *S. devenyense* Simonk.** — Biennial up to perennial, stems erect, 30-120 cm high, rounded, fine grooved, ramified. **Fruits polachenarium, ovoid to elliptic, dorsal side convex with five ridges, ventral side flat, 2.7-3.1 x 1.5-1.7 mm. Surface verrucose, fine hirsute (fresh seeds) or bare (old seeds), valleculeae greyish-brown, ridges pale-brown. 2n = 18.**



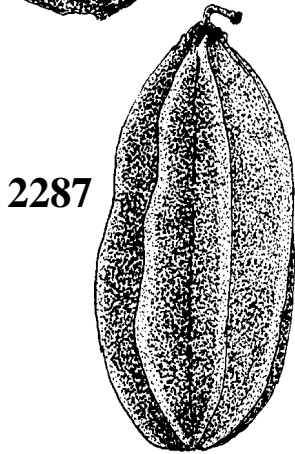
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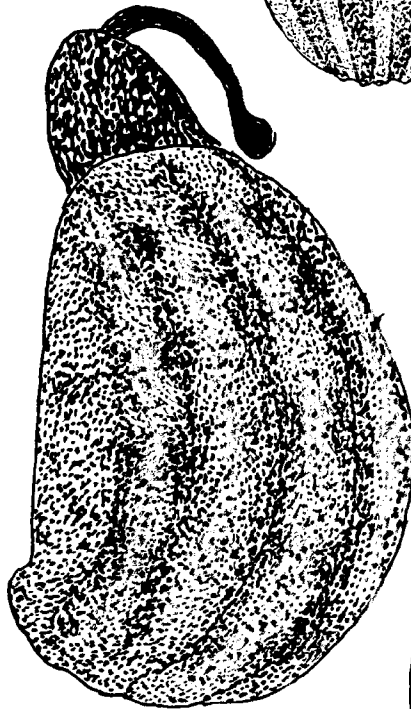
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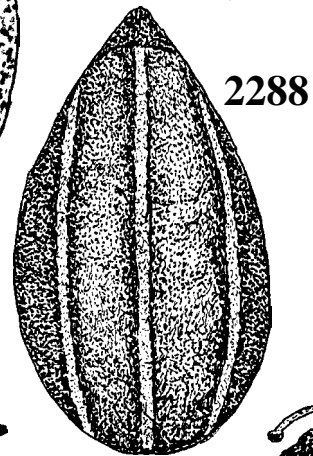
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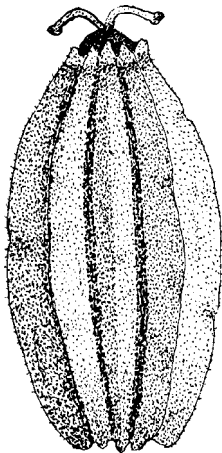
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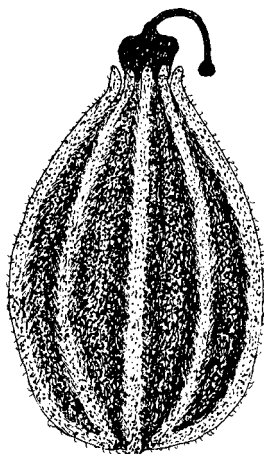
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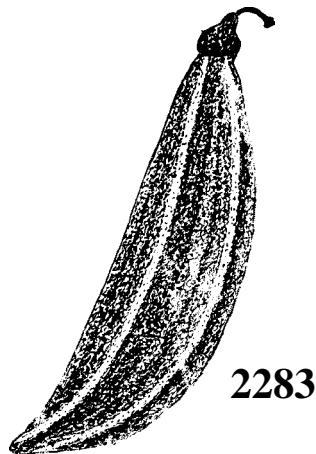
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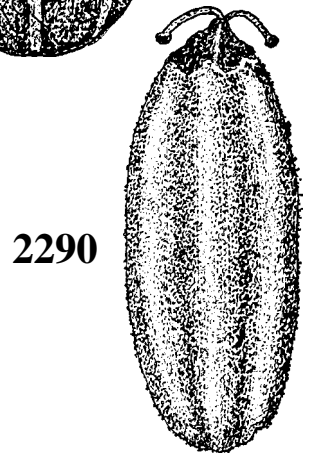
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2292



2283



2290

Endemic to Pannonia, on sunny slopes, rocks and dry sandy pastures. Hu, Ro, Sk.

**2293. *Seseli pallasii*** Besser, *S. varium* Trevir. — Biennial up to perennial, stems 30-120 cm high, erect, rounded, ramified from base. **Fruits polachenarium, ovoid to ellipsoid or oblong, with five ridges, dorsal side convex, ventral side flat, 3-3.6 x 1.5-1.9 mm. Surface glabrous or slight tuberculate-verrucose, valliculae dark-brown, ridges whitish. 2n = 16, 18.** Native to European sunny steppe slopes, pastures, sandbanks and forest edges. Hu, Mo, Ro, Sk, Uk.

**2294. *Seseli rigidum*** Waldst. et Kit., *S. serbicum* Degen — Perennial, stem erect, stift, up to 80 cm high, grooved, downy, branched. **Fruits polachenarium, ellipsoid, dorsal side with five ridges, ventral side flat, calyx-teeth broad triangular, 3-4 x 1.9-2.3 mm. Dorsal side surface covered with dense papillae, valliculae brown, ridges whitish. 2n = 18.** Native to the Balkan regions, on chalk and dolomite rocks. Ro.

**2295. *Seseli tortuosum*** L., *S. pauciradiatum* Schischkin — Biennial, whole plant greyish-green, stems flexible, rounded, fine striate, 20-50 cm high. **Fruits polachenarium, prolonged ellipsoid or ovoid, ridges high, nearly winged, ventral ridges broader than the others, 3.5-4.3 x 1.8-2.2 mm. Surface puberulent, valliculae greyish, ridges dirty-white.** Native to southern and southeastern Europe, on dry stony and sandy slopes, steppes, pastures and clearings. Pl, Ro, Uk.

**2296. *Libanotis pyrenaica*** (L.) Bourg., *L. montana* Crantz, *Seseli libanotis* (L.) W. D. J. Koch — Biennial up to perennial, stems erect, 40-120 cm high, deeply furrowed, ramified. **Fruits polachenarium, ellipsoid, horizontal flattish, dorsal side convex with five ridges, ventral side with two vittae canals, 4-4.5 x 2-2.4 mm. Surface pubescent, lustreless, valliculae reddish-brown, ridges straw-brown. 2n = 22.** Native to Eurasian overgrown rocks, grassy steppe slopes and shrubberies; throughout the Carpathians.

**2297. *Libanotis sibirica*** (L.) C. A. Meyer, *L. montana* var. *gracilis* Kryl., *L. intermedia* Rupr. — Perennial, stem sole, erect, ramified in the upper part, 50-120 cm high. **Fruits polachenarium, prolonged ellipsoid, dorsal side slight convex with five thin ribs, ventral side flat, 5-6 x 2-2.5 mm. Surface smooth to tuberculate, straw-brown.** Native to eastern Europe and Siberia, in coniferous and mixed

forests, clearings, pastures and calcareous slopes, rare. Hu, Pl, Ro, Uk.

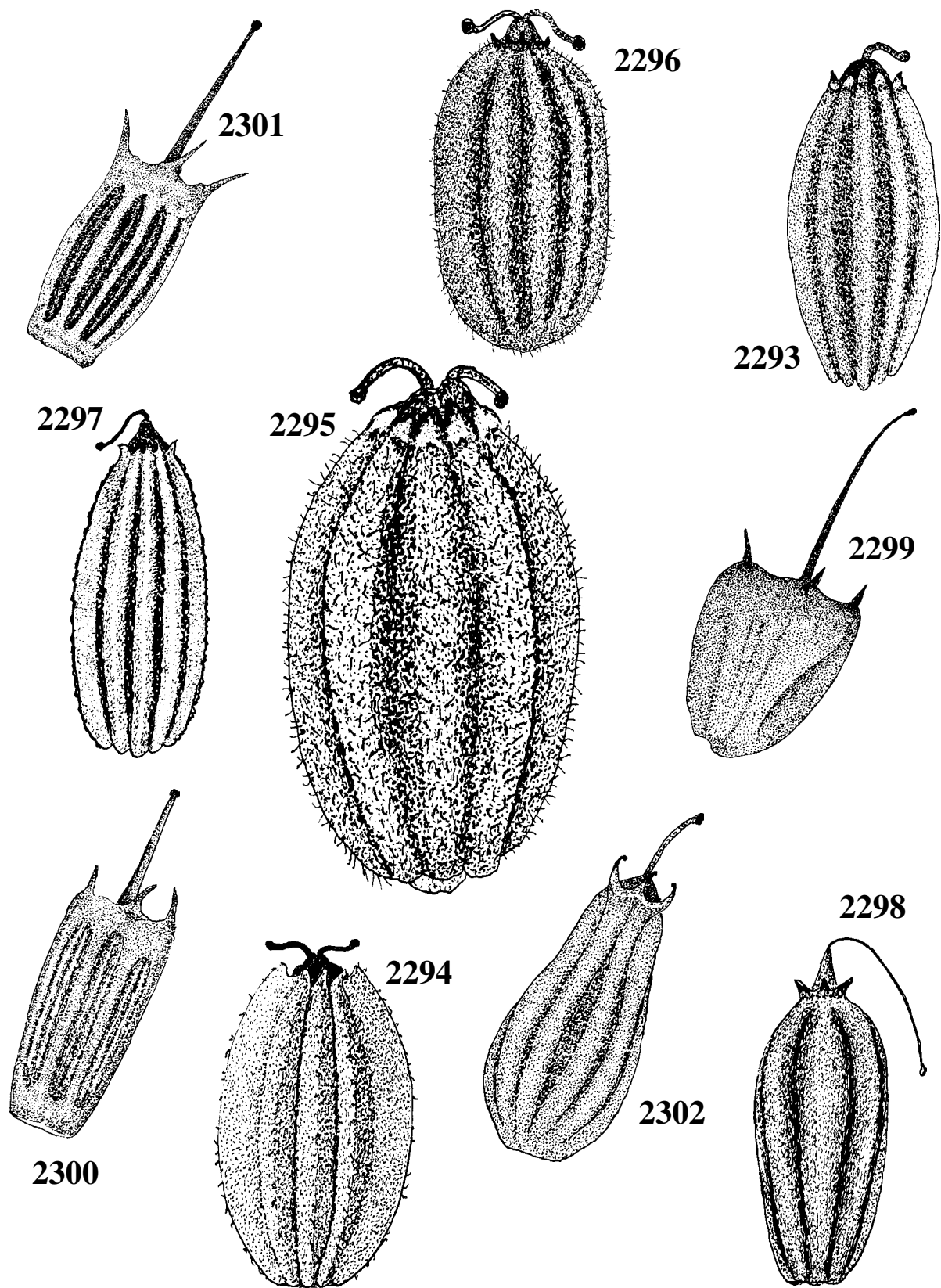
**2298. *Oenanthe banatica*** Heuff., *Oe. silaifolia* Heuff. non M. Bieb. — Perennial, stems erect, slender, 60-90 cm, grooved, branched. **Fruits polachenarium, ellipsoid or ovoid, ventral side flat, dorsal side with five rounded ridges, style c. 2 mm long, 3.4-3.8 x 1.3-1.5 mm. Surface smooth, glabrous, pale-brown. 2n = 22.** Native to southern Europe, in damp meadows and lowland forests in proximity of river inundation areas. Hu, Pl, Ro, Sk, Uk.

**2299. *Oenanthe fistulosa*** L., *Phellandrium fistulosum* (L.) Clairv. — Perennial, up to 80 cm high, stems erect, slender, striate, hollow, little branched. **Fruits polachenarium, cylindric or obconical, with some spines at truncate apex, style sometimes as long as the fruit, 3.8-4.2 x 2.8-3.2 mm. Surface wrinkly, dull, pale-brown. 2n = 22.** Native to Euro-Siberian swamps, wet places and riverbanks. Br, Hu, Pl, Ro, Sk.

**2300. *Oenanthe lachenalii*** C. C. Gmelin, *O. marginata* Vis. — Perennial, up to 100 cm high, stems erect, solid, or with a small central cavity when older. **Fruits polachenarium, cylindric, truncate, ventral side flat, apex with three spines, style c. 2/3 of the fruit, 3.5-4.5 x 1.5-1.7 mm. Surface with 4 depressions on the dorsal side, ventral side smooth with longitudinal ridge. 2n = 22.** Native to western and central European wet grasslands. Pl.

**2301. *Oenanthe silaifolia*** M. Bieb., *O. media* Griseb. — Annual, erect, hollow, grooved, up to 100 cm high, sparsely branched, striate, reddish-spotted. **Fruits cylindric or obconical, truncate apex with some spines, styles almost as long as fruits, 4-5 x 1.8-2.2 mm. Surface with rough lateral and corrugate dorsal ribs, dull, brown. 2n = 22.** Native to central and southern Europe, in wet places. Hu, Mo, Ro, Sk, Uk.

**2302. *Phellandrium aquaticum*** L., *Oenanthe aquatica* (L.) Poir., *O. phellandrium* Lam. — Annual up to biennial, stems up to 150 cm high, hollow, striate and grooved, umbels terminal or leaf-opposed. **Fruits polachenarium, oblong-elliptical or pyriform, planoconvex, with 5 ribs on dorsal side and 2 longitudinal furrows on ventral side, 4.2-4.8 x 1.3-1.7 mm. Surface smooth, dull, pale-brown, ventral side whitish. 2n = 22.** Native to Eurasia, in



still or slowly flowed waters, wet meadows; in all Carpathian territories.

**2303. *Aethusa cynapium* L.** — Annual or biennial, stems 5-200 cm, leafy, finely grooved, hollow, ramified. **Fruits polachenarium, ovoid, dorsal side convex with five obtuse, keeled to winged ridges, ventral side flat, 2.8-3.4 x 2-2.4 mm. Surface dull, glabrous, valleculeae dark-brown, ridges straw-brown. 2n = 20.** Native to Eurasian shrubberies, gardens, pastures, waste places, ruins, weed of cultivated lands; in all Carpathian territories.

**2304. *Foeniculum vulgare* Mill., *F. officinale* All.** — Biennial - perennial, stems erect, 50-200 cm high, glabrous, fine striate, branched. **Fruits polachenarium, ovoid-oblong, ventral side flat, ribbed, dorsal side convex with five distinct, keeled ridges, stylopodium conical, 7-8 x 2.3-2.7 mm. Surface dull, glabrous, valleculeae dark-brown, ridges light-brown. 2n = 22.** Probably native to southwestern Europe, long time ago, cultivated as a spice (fruit), naturalized in fallows, composts, ruins, waste places; throughout the Carpathians.

**2305. *Anethum graveolens* L.** — Annual, an aromatic, glabrous, greyish-green plant, stems erect, fine grooved, hollow, 20-100 cm high, branched. **Fruits polachenarium, elliptic to ovoid, ventral side flat, dorsal side convex with five ridges, 3.5-4.1 x 1.5-1.9 mm. Surface dull, glabrous, brown, ridges pale-brown. 2n = 22.** Originally growing in Asia; in Europe cultivated as a vegetable since ancient times, naturalized in coastal shrubberies and waste places; in all Carpathian regions.

**2306. *Silaum alpestre* (L.) Thell., *Peucedanum alpestre* L.** — Perennial, stems glabrous, up to 120 cm high, ramified in upper part. **Fruits polachenarium, ovoid to subcylindric, dorsal side with five winged ridges, ventral side flat, with two stripes of vittae, 5.2-5.8 x 1.8-2.2 mm. Surface dull, glabrous, brown to dark-brown.** Native to central Europe and central Asia, on saline meadows and dry steppes, in sandy and moist forests. Uk.

**2307. *Silaum silaus* (L.) Schinz et Thell., *S. selinoides* Jacq.** — Perennial, stems erect, 30-100 cm high, solid, angular, ramified. **Fruits polachenarium, ellipsoid, ventral side flat, dorsal side convex with five acute ridges, stylopodium conical, 5-6 x 2-2.4 mm. Surface glabrous, dull, orange-brown. 2n = 22.** Native to European meadows, moors and bound-

aries with sand-loamy soils; nearly in all Carpathian regions.

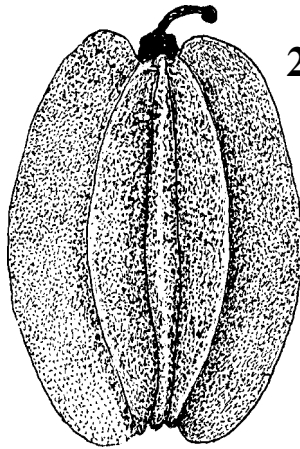
**2308. *Meum athamanticum* Jacq.** — Perennial, fragrant, stems erect, angular, grooved, up to 60 cm high. **Fruits polachenarium, prolonged ellipsoid, slight curved, dorsal side convex with five ridges, ventral side flat with two shallow longitudinal grooves (vittae), 6.5-8 x 2.3-2.7 mm. Surface dull, glabrous, dark-brown, ridges paler. 2n = 22.** Native to Europe, in mountain meadows with moist, arid in summer, non-calcareous stony and loamy soils. Pl.

**2309. *Mutellina purpurea* (Poir.) Thell., *Meum mutellina* (L.) Gaertn.** — Perennial, aromatic, stems erect, sparsely ramified, 10-50 cm high, hollow, angular. **Fruits polachenarium, prolonged ellipsoid, dorsal side convex with five distinct ridges, ventral side flat with two concave grooves, both ends narrowed, base truncate, 4-5 x 1.6-1.8 mm. Surface glabrous, dull, brown, ridges pale. 2n = 22.** Native to the Alps and the Carpathians, in mountain meadows, pastures, light forests with moist and loamy soils. Pl, Ro, Sk, Uk.

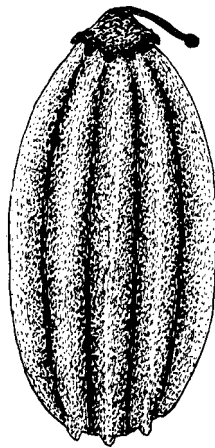
**2310. *Pachyleurum simplex* (L.) Rchb., *Neogaya simplex* (L.) Meisn.** — Perennial, stems 10-30 cm high, simple, erect, full, grooved, glabrous. **Fruits polachenarium, prolonged ellipsoid, dorsal side convex with five winged ridges, ventral side flat with 4 vittae, 4.5-5 x 3.2-3.6 mm. Surface dull, glabrous, brown, ridges paler. 2n = 22.** Native to arctic and mountain Eurasia, on stony meadows, overgrown slopes and screes. Pl, Ro, Sk.

**2311. *Selinum carvifolia* (L.) L., *Seseli carvifolia* L.** — Perennial, stems erect, 30-100 cm high, narrow wingly, angular, full, ramified in the upper part. **Fruits polachenarium, broad ellipsoid, dorsal side with five wing-like ridges (the lateral one broader), ventral side flat with 2-6 visible vittae, 3.7-4.1 x 2.6-3 mm. Surface dull, glabrous, valleculeae dark-brown, ridges light-brown. 2n = 22.** Native to Eurasian wet meadows, peatbogs, lowland and humous forests, mostly with neutral soils; in all Carpathian regions.

**2312. *Cnidium dubium* (Schkuhr) Thell., *Seseli venosum* Hoffm.** — Biennial up to perennial, stems terete, 30-100 cm high, rounded below, angularly grooved above, little branched. **Fruits polachenarium, broad ellipsoid to ovoid, dorsal**



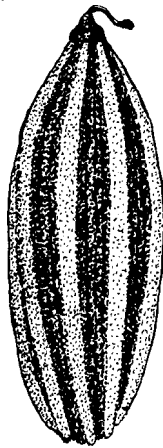
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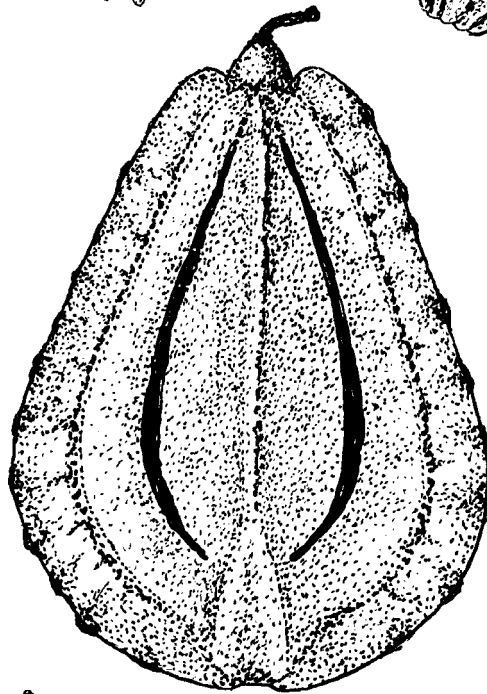
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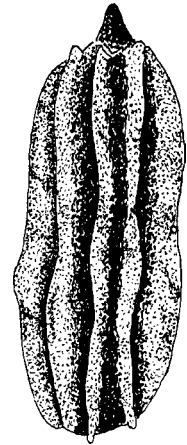
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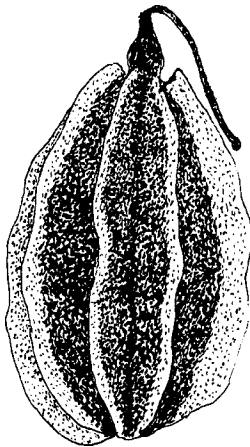
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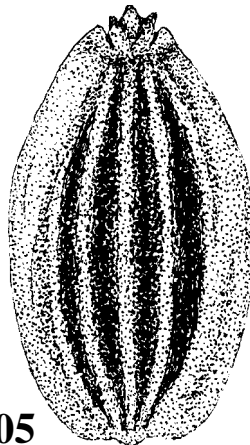
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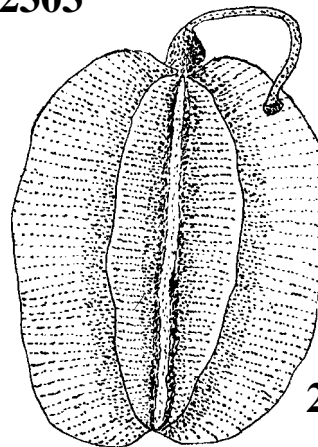
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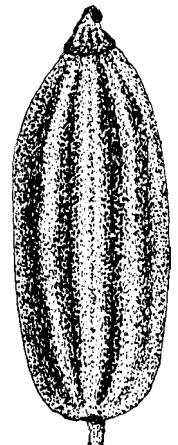
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2311



2304

side with five prominent winged ridges, ventral side flat with visible vittae, 4.3-3.8 x 1.9-2.1 mm. Surface glabrous, dull, valliculae dark-brown, ridges light-brown.  $2n = 22$ . Native to Eurasian wet and peatbog meadows, edges of lowland forests; throughout the Carpathians.

**2313. *Cnidium silaifolium*** (Jacq.) Simk., *C. apioides* (Lam.) Spreng. — Perennial, stems erect, 40-100 cm high, grooved, full, little branched above. **Fruits polachenarium, ellipsoid to broad ovoid, dorsal side with five winged ridges, ventral side flat with two canals of vittae, 4-4.5 x 1.9-2.3 mm. Surface papillary, dull, valliculae dark-brown, ridges light-brown.  $2n = 22$ .** Native to southeastern Europe and western Asia, at forest edges, in rocky places, on shrubby stones and stony screes, in warmer areas. Ro.

**2314. *Opopanax bulgaricum*** Velen. — Perennial, stems up to 2 m high, erect, cylindric, finely striate, branched above. **Fruits polachenarium, obovoid or ellipsoid, lateral compressed, dorsal side flat or slight convex, with 3 ribs and 10 vittae, margin winged, ventral side flat with a longitudinal rib and 8 furrows, 7.8-8.5 x 5-6 mm. Surface smooth, dull, dark-brown, wings yellowish.** Native to Bulgarian sunny coasts and rocky places. Ro.

**2315. *Opopanax chironium*** (L.) Koch, *Laserpitium chironium* L. — Perennial, stems up to 2.5 m high, erect, cylindric, striate, sometimes hirsute, branched above. **Fruits polachenarium, ellipsoid, lateral compressed, dorsal side flat or slight convex with 10 vittae, 3 ribs, margin winged, 7-8.5 x 5-6 mm. Surface smooth, dull, dark-brown, margin pale-brown.** Native to the Mediterranean, in stony places and on shrubby slopes. Ro.

**2316. *Conioselinum tataricum*** Hoffm., *C. vaginatum* (Spreng.) Thell. — Perennial, stems erect, 50-150 cm, grooved, branched above. **Fruits polachenarium, ellipsoid, flattish, dorsal side with three short and two lateral broad ridges, ventral side with four or more vittae canals, 5.8-7.3 x 3.7-4.3 mm. Surface dull to lustrous, glabrous, valliculae dark-brown, ridges light-brown.  $2n = 22$ .** Native to Eurasian mountain forests, shrubberies and meadows. Pl, Ro, Sk, Uk.

**2317. *Cenolophium denudatum*** (Hornem.) Tutin, *Athamanta denudata* Hornem, *C. fischeri* (Spreng.) Koch ex DC. — Perennial, glabrous, stems 50-100 cm high, solid, terete, striate, often purplish, leaves

triangular in outline, 3- to 5-pinnate. **Fruits polachenarium, ellipsoid, planoconvex, winged, 3-angled, 5-6 x 1.9-2.3 mm. Surface smooth, dull, pale-brown.** Native to eastern Europe, on river sandy banks and steppes, wet meadows. Br, Pl, Uk.

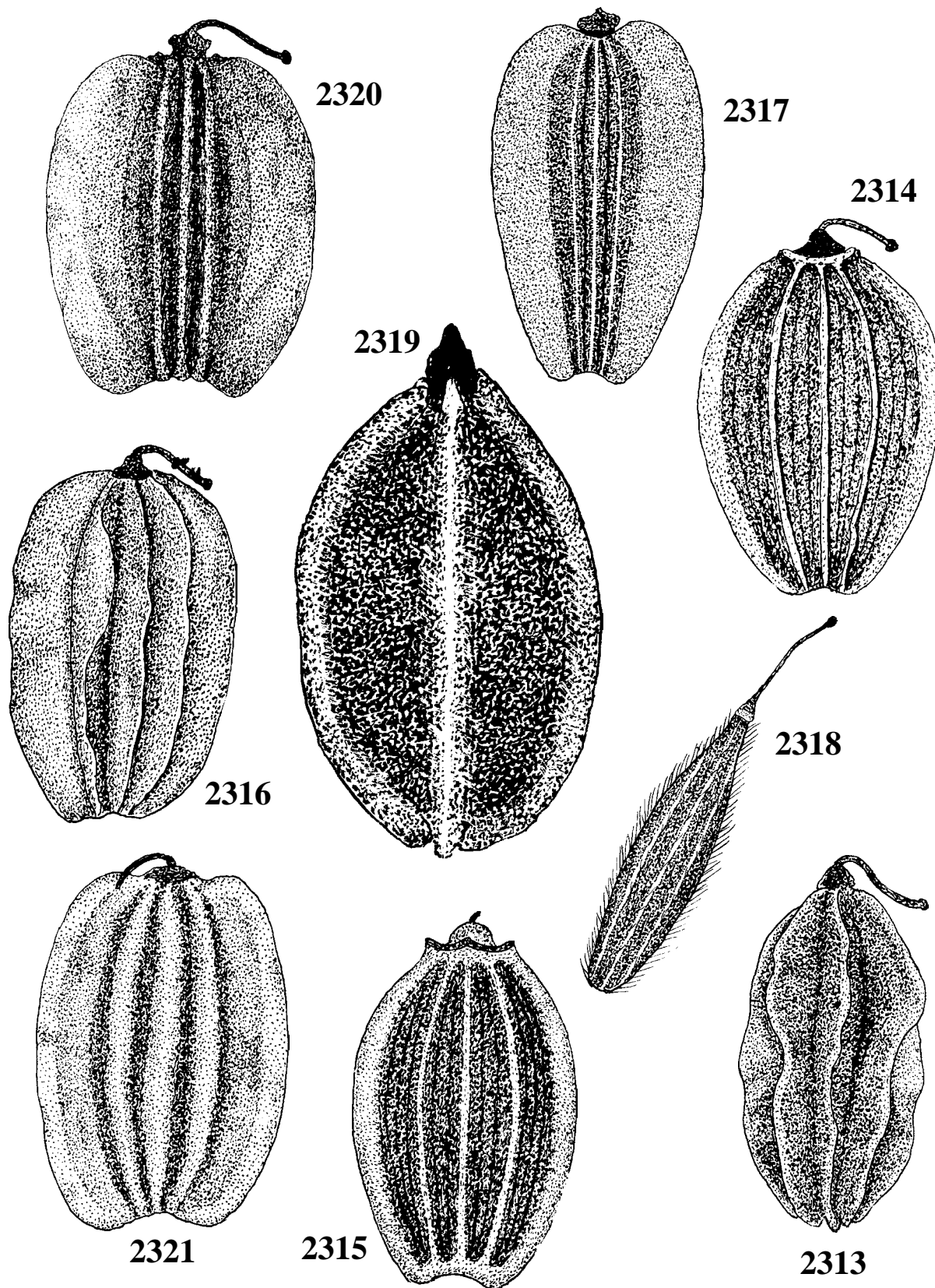
**2318. *Athamanta turbith*** (L.) Brot., *A. hungarica* Borbás — Perennial, stems ascendent or erect, pubescent, abundantly branched from the base. **Fruits polachenarium, prolonged ellipsoid, narrowed above, dorsal side convex with five ridges, lateral ridges approached, ventral side flat with two vittae canals, styles erect, half of the fruit, 6.5-7.5 x 1.5-1.8 mm. Surface dense pubescent all over, dark-brown, 5 ridges pale.** Native to the southern Carpathians, on calcareous rocky slopes. Ro.

**2319. *Sison amomum*** L. — Biennial, stems erect, 30-100 cm high, slender, fine grooved, much ramified. **Fruits polachenarium, ellipsoid to obovoid, five ridges on dorsal side, lateral ridges approached, ventral side flat, vittae solitary, widest below the middle, 2.4-2.6 x 1.2-1.5 mm. Surface fine granulate, dull, blackish-brown.** Native to southern Europe, Asia Minor and northern Africa, in shrubberies, rocky and grassy places. Ro.

**2320. *Angelica sylvestris*** L. — Perennial, stems erect, 50-200 cm high, grooved, hollow, angular and ramified above. **Fruits polachenarium, ovoid to ellipsoid, flattish, dorsal side with prominent crowded ridges, low and slight winged, lateral ridges very broad winged, ventral side with two vittae canals, 4.5-5.5 x 3.7-4.3 mm. Surface dull, glabrous, valliculae dark-brown, ridges pale-brown.  $2n = 22$ .** Native to Euro-Siberian damp meadows, peatbogs, light forests and shrubberies; almost throughout the Carpathians.

**2321. *Archangelica officinalis*** Hoffm., *Angelica archangelica* L. — Perennial, stems erect, hollow, grooved, ramified, often reddish. **Fruits polachenarium, ellipsoid to semiglobose, flattish, dorsal side with three intermedial low  $\pm$  crowded ridges, two lateral ridges larger and wing-shaped, ventral side without visible vittae, 7-8 x 4-5 mm. Surface of the whole fruit light-brown.  $2n = 22$ .** Native to Eurasian mountain meadows and riverbanks with wet, humous soils; almost throughout the Carpathians.





**2322. *Ostericum palustre*** (Besser) Besser, *Imperatoria palustris* Besser — Biennial up to perennial, stems, 50-125 cm erect, robust, branched in upper part. **Fruits polachenarium, ellipsoid, flattish, dorsal side with three low, crowded ridges and two membranous, broad lateral wings, ventral side with two vittae canals, 4.2-5 x 3.2-3.6 mm. Surface dull, slight downy, brown.** Native to eastern Europe and Siberia, in wet peatbogs, marshy meadows, coastal shrubberies, rare. Hu, Mo, Pl, Ro, Sk, Uk.

**2323. *Levisticum officinale*** W. D. J. Koch — Perennial, an aromatic plant, stems erect, 1-2 m high, hollow, rounded, grooved, ramified. **Fruits polachenarium, ellipsoid, ventral side flat, vittae six (one in each vallecule and two on ventral side), calyx-teeth obsolete with five ridges (the lateral larger than the others), 6-7 x 2.8-3.8 mm. Surface dull, glabrous, vittae dark-brown. 2n = 22.** Native to western Asia, in Europe cultivated in gardens as a vegetable, naturalized on meadows and brookbanks; in all Carpathian territories.

**2324. *Ferula caspica*** M. Bieb. — Perennial, up to 30-60 cm high. **Fruits polachenarium, prolonged ellipsoid, compressed, three dorsal ridges low, lateral ridges broad, winged, ventral side with central longitudinal ribs and some pale vittae, 12-14 x 5.8-6.4 mm. Surface dull, glabrous, ridges pale-brown.** Native to eastern Europe, on dry, saline soils. Uk.

**2325. *Ferula heuffelii*** Gris. — Perennial, stems robust, up to 150 cm high, rounded, grooved, ramified in upper part. **Fruits polachenarium, prolonged ellipsoid, compressed, dorsal ridges filiform and closely compressed to one another, lateral broaden, ventral side with 2-4 vittae canals, 8.5-9.5 x 4-4.6 mm. Surface dull, glabrous, vallecule dark-brown, ridges pale-brown.** Native to the Balkan Peninsula, in shrubberies, on dry, rocky calcareous slopes. Ro.

**2326. *Ferula sadlerana*** Ledeb., *Ferulago sadleri* Gris. et Schenk — Perennial, robust, stems up to 200 cm high, rounded, grooved, ramified. **Fruits polachenarium, prolonged ellipsoid, flattish, dorsal ridges filiform, lateral side broad winged, ventral side with 2-4 vittae canals, 10-13 x 5-7 mm. Surface dull, glabrous, vallecule dark-brown, ridges light-brown. 2n = 22.** Endemic to Pannonia, on dry karst rocks and shrubby forest steppes. Hu, Ro, Sk.

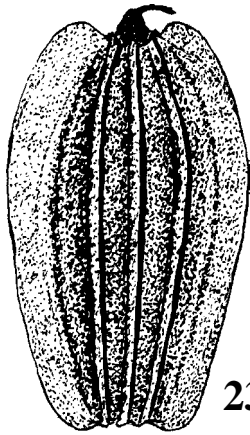
**2327. *Ferulago campestris*** (Besser) Grec., *F. galbanifera* Koch — Perennial, stems up to 2 m high, erect, grooved, leafy below, ramified above. **Fruits polachenarium, elliptic-oblong to obovoid, flattish, dorsal ridges filiform, lateral winged, ventral side with central rib and 4-12 vittae canals, 10-13 x 7-8 mm. Surface brown to dark-brown, dull, glabrous.** Native to southern and southeastern Europe, on rocky slopes and sunny meadows. Mo, Pl, Ro, Uk.

**2328. *Ferulago confusa*** Velen., *F. meoides* (L.) Boiss., *Lophosciadium meoides* Calestani — Perennial, stems grooved, leafy at the bottom, branched above. **Fruits polachenarium, ellipsoid, flattish, three dorsal intermediate ridges approached, curly winged, lateral ridges broad curly winged, ventral side with 6-12 vittae canals, 10-14 x 6-9 mm. Surface dull, glabrous, brown to dark-brown, ridges pale.** Native to southeastern Europe, on sunny meadows, slopes, forest clearings. Ro.

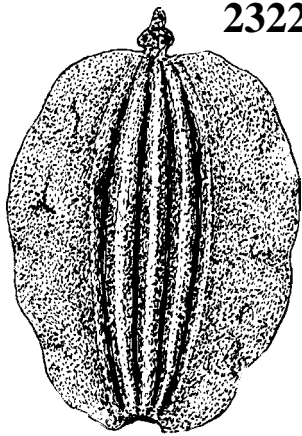
**2329. *Ferulago sylvatica*** (Besser) Rchb., *Ferula sylvatica* Besser — Perennial, stems erect, up to 125 cm high, grooved, branched in upper part. **Fruits polachenarium, prolonged ellipsoid, flattish, dorsal ridges filiform, lateral ridges broad, winged, ventral side with central rib and 6-10 visible vittae, 10-13 x 6-7 mm. Surface reddish-brown, ridges pale.** Southeastern European and eastern Carpathians element, in shrubberies and deciduous forests, rare. Hu, Mo, Pl, Ro, Uk.

**2330. *Tommasinia altissima*** (Mill.) Thell., *Peucedanum verticillare* (L.) Koch ex DC. — Perennial, stem 1-3 m high, up to 5 cm in diam. below, erect, hollow, ramified. **Fruit, ellipsoid, flattish, dorsal three ridges filiform, lateral ridges broad winged, up to 2-2.5 mm wide, ventral side with two vittae canals, 7-9 x 6-7 mm. Surface pale-brown, vallecule dark-brown. 2n = 22.** Originally growing in southern Europe, rarely hauling into the Carpathians. Hu.

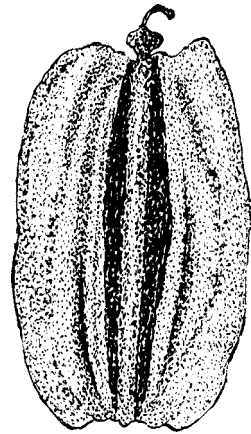
**2331. *Peucedanum alsaticum*** L., *Ligusticum alsaticum* (L.) Link — Perennial, stems erect, 30-150 cm high, hollow, grooved, shoots numerous. **Fruits polachenarium, elliptic to obovoid, flattish, base truncate, three intermedial ridges narrow, rooflike, lateral ridges broad, winged, ventral side with two visible vittae, 4.7-5.3 x 2.7-3.1 mm. Surface dull, glabrous, lustrous, brown, vallecule dark-brown. 2n = 22.** Native to Eurasian shrubby



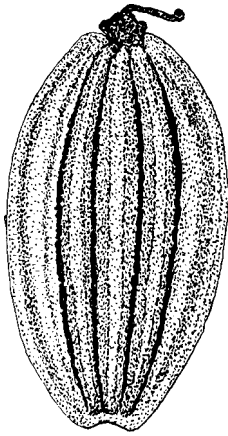
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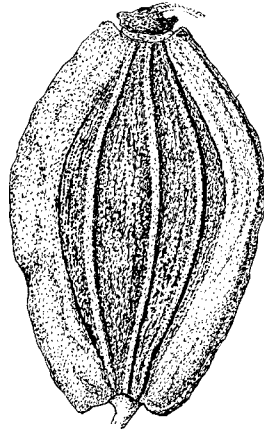
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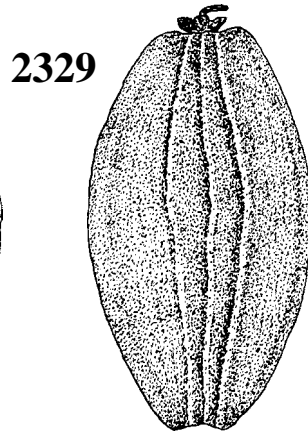
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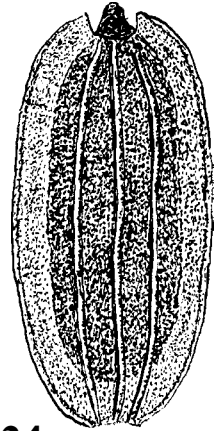
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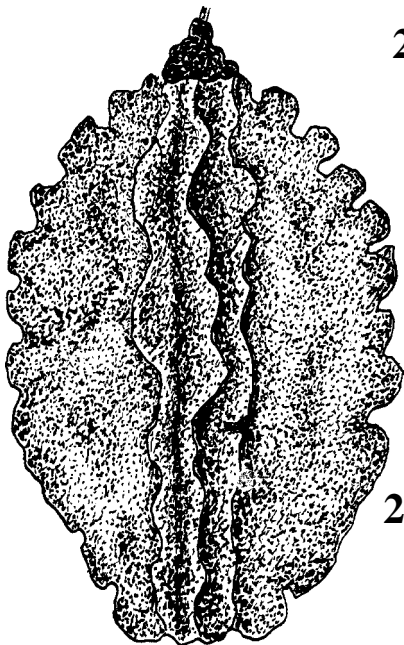
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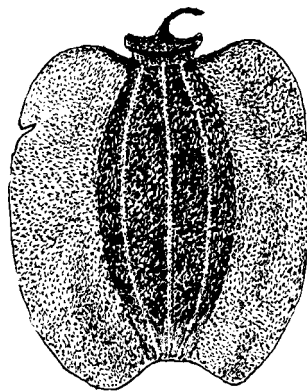
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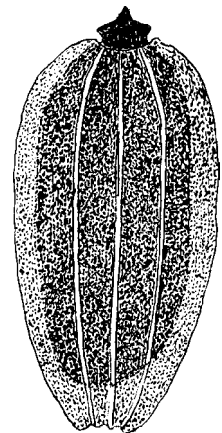
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2325

forest steppes, pastures and vineyards. Hu, Mo, Pl, Ro, Sk, Uk.

**2332. *Peucedanum arenarium*** Waldst. et Kit. — Perennial, stems erect, 90-150 cm high, rounded, grooved, ramified above. **Fruits polachenarium, broad ellipsoid to globose, flattish, dorsal side with three intermediate, indistinct ridges, lateral ridges broad and winged, ventral side with two vittae, 6-8 x 4.5-5.5 mm. Surface dull, glabrous, brown to dark-brown. 2n = 22.** Native to central Europe (Pannonia) on sandbanks, in light deciduous forests. Hu, Mo, Ro, Sk, Uk.

**2333. *Peucedanum austriacum*** (Jacq.) Koch, *Selinum austriacum* Jacq. — Perennial, stems erect, 30-120 cm high, grooved, full, branched above. **Fruits polachenarium, broad ellipsoid, flattish, three dorsal indistinct ridges narrow, two lateral ridges broad winged, ventral side with 2 or 4 vittae, 6-9 x 4-5 mm. Surface dull, glabrous, ashy. 2n = 22.** Native to central Europe and the eastern Mediterranean, on rocky slopes, shrubberies, on calcareous substrates, in montane zone. Ro.

**2334. *Peucedanum carvifolia*** Vill., *P. chabraei* (Jacq.) Rchb. — Perennial, stems erect, 30-100 cm high, full, grooved and ramified above. **Fruits polachenarium, broad ellipsoid, flattish, three dorsal intermediate ridges are filiform, lateral ridges broad winged, ventral side with two vittae, 4.8-5.2 x 2.8-3.2 mm. Surface dull, glabrous, reddish-brown, valleculeae dark-brown.** Native to European sunny shrubby slopes, forest steppes, dry meadows and pastures. Hu, Mo, Pl, Ro, Sk, Uk.

**2335. *Peucedanum cervaria*** (L.) Cusson, *Selinum cervaria* L. — Perennial, stems erect, 30-150 cm high, grooved, poorly ramified. **Fruits polachenarium, suborbicular to elliptic, dorsal ridges scarce prominent, lateral ridges winged, ventral side with two vittae, 5.4-6.2 x 4-5 mm. Surface roughish, dull, brown, valleculeae dark-brown. 2n = 22.** Native to European sunny, grassy and shrubby slopes and light forests. Hu, Mo, Pl, Ro, Sk, Uk.

**2336. *Peucedanum latifolium*** (M. Bieb.) DC., *Athamanta latifolia* Viv., *Selinum latifolium* Schur — Perennial, up to 40-100 cm high, glabrous, stem terete, striate, angled above, solid, branched. **Fruits polachenarium, elliptical, dorsal ridges filiform, inconspicuous wing c. 0.5 mm wide, 4.8-5.2 x 4.3-4.7 mm. Surface of the central part slight**

**waved, lustrous, dark reddish-brown, margin pale-brown, lustreless.** Native to southern and the eastern Carpathians, in damp places. Mo, Ro, Uk.

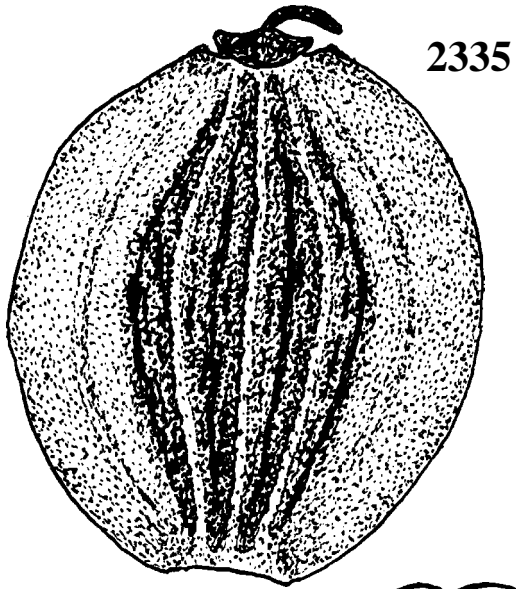
**2337. *Peucedanum longifolium*** Waldst. et Kit. — Perennial, stems erect, up to 2 m high, grooved, glabrous, ramified above. **Fruits polachenarium, cylindric, slight curved, dorsal side with four winged waved ridges, ventral side with two vittae, 9-11 x 4-4.7 mm. Surface yellowish-brown, valleculeae dark-brown.** Native to Balkan territory on calcareous rocky slopes and pine forests. Ro.

**2338. *Peucedanum officinale*** L. — *Selinum peucedanum* Web. — Perennial, stems erect, solid, grooved, full, ramified above. **Fruits polachenarium, broad ellipsoid, dorsal intermediate ridges almost low and flat, interspace with the vascular bundles, lateral broad ridges without visible vascular bundles, ventral side with two vittae, 7-10 x 4-5.5 mm. Surface pale-brown, valleculeae dark-brown. 2n = 66.** Native to European shrubby forest steppes and dry pastures. Hu, Ro, Sk.

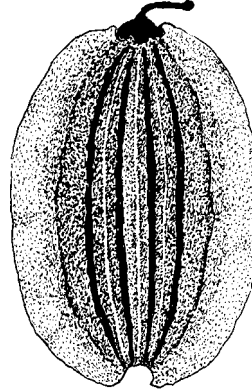
**2339. *Peucedanum oreoselinum*** (L.) Moench, *Athamanta oreoselinum* L. — Perennial, stems erect, 30-100 cm high, terete, grooved, ramified, reddish. **Fruits polachenarium, broad elliptic, flattish, intermediate ridges flat, slender, lateral ridges broad winged, sometimes with curly margin, ventral side with two vittae, 5-6.6 x 4-5.4 mm. Surface high lustrous, glabrous, brown, valleculeae dark-brown. 2n = 22.** Native to European pine forests, forest steppes and sunny shrubby slopes; throughout the Carpathians.

**2340. *Peucedanum palustre*** (L.) Moench, *Selinum palustre* L. — Biennial, stems erect, 30-100 cm high, angularly grooved, rough up to hirsute. **Fruits polachenarium, broad ellipsoid, flattish, dorsal intermediate ridges rooflike, lateral ridges broad winged, vittae on ventral side invisible, 5.4-6 x 3.7-4.1 mm. Surface dull, glabrous, reddish-brown (dorsal side) or pale-brown (ventral side). 2n = 22.** Native to Eurasian marshy lands, peatbogs, lowland forests and reed swamps. Hu, Pl, Ro, Sk, Uk.

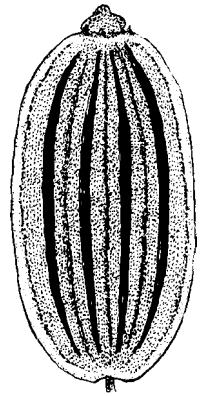
**2341. *Peucedanum ruthenicum*** M. Bieb. — Perennial, up to 100 cm high, stock c. 1 cm in diam., stems terete, striate, solid. **Fruits polachenarium, prolonged ellipsoid, compressed, all fifth dorsal ridges low with short wings or without, ventral side flat with two dark-brown vittae, 7-8 x 3.5-4**



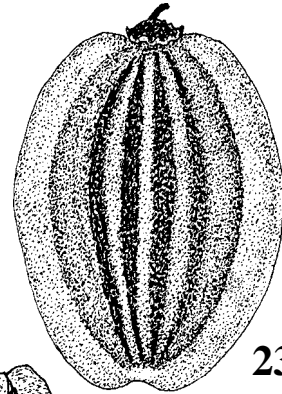
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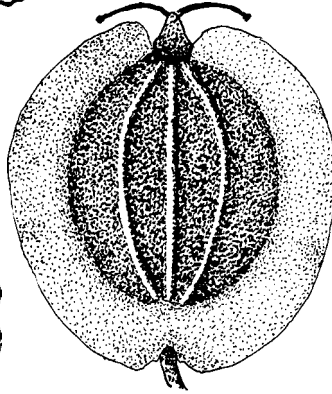
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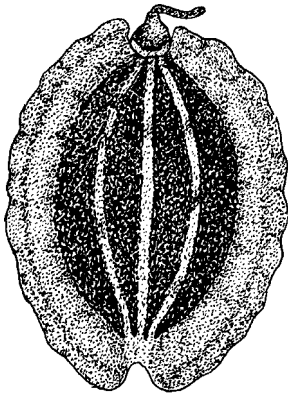
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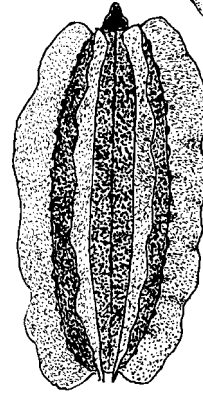
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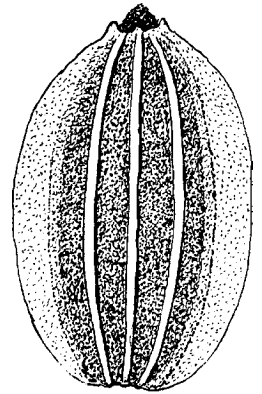
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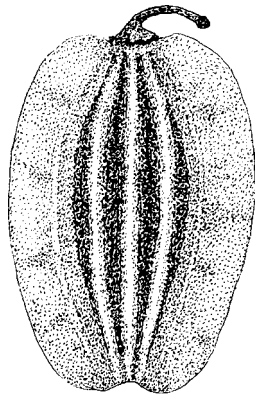
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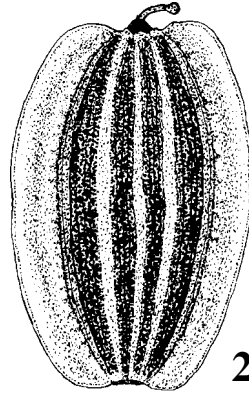
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2338

mm. Surface pale or to dark-brown, vallecule dark-brown, ridges pale-brown. Native to South-East Carpathians, in dry places. Mo, Ro, Uk.

**2342. *Peucedanum schottii*** Besser ex DC. — Perennial, up to 40-100 cm high, glabrous, stems sulcate at least above, solid, branched. **Fruits polachenarium, broad ellipsoid, dorsal ridges filiform, rather prominent, drab, lateral ridges narrow, ventral side with two vittae, 7-8 x 3.5-4 mm. Surface pale-brown, ventral side whitish-brown, vallecule and vittae dark-brown.** Native to southern Europe, on calcicole rocky slopes. Uk.

**2343. *Peucedanum tauricum*** M. Bieb., *P. campestre* Janka — Perennial, stems erect, up to 40-80 cm high, striate glabrous, terete, solid. **Fruits polachenarium, oblong obovoid, apex broader, truncate, bottom gradually narrowed, rounded, dorsal side with 3 ridges, lateral ridges broad winged, ventral side with 2 vittae, 8.5-9 x 3.6-4 mm. Surface dull, areas between the ribs dark-brown, wing yellowish, ribs pale-orange.** Native to Romania and Crimea, on dry hillsides and pine-woods. Ro.

**2344. *Imperatoria ostruthium*** L., *Selinum imperatoria* Crantz — Perennial, stems erect, 30-100 cm high, grooved, hollow, simple or branched above. **Fruits polachenarium, broad elliptic to circular, flattish, dorsal intermediate ridges low, rooflike, lateral ridges broad winged, ventral side with 2 visible vittae, 4.8-5.6 x 3.5-4.1 mm. Surface dull, glabrous, yellowish-white, vallecule dark-brown. 2n = 22.** Native to European mountain meadows, overgrown screes and dwarf pine areas, once cultivated as popular medical plant and naturalized. Pl, Ro, Sk.

**2345. *Pastinaca graveolens*** M. Bieb., *Malabaila graveolens* Hoffm., *Heracleum graveolens* Spreng. — Biennial, up to 100 cm high, shortly pubescent, angular, usually branched in upper part. **Fruits polachenarium, subcircular to broad elliptic, flattish, dorsal side with five ridges (three intermediate filiform, lateral broad winged), ventral side with two vittae (c. 2/3 of the mericarp), 5-6 x 3.2-3.6 mm. Surface dull, glabrous, greyish-brown, vittae dark-brown. 2n = 22.** Native to southeastern Europe and the Balkan Peninsula, on sunny slopes, forests and way margins. Mo, Ro, Uk.

**2346. *Pastinaca sativa*** L. — Biennial, stems erect, 30-100 cm, angularly grooved, coarse to hirsute,

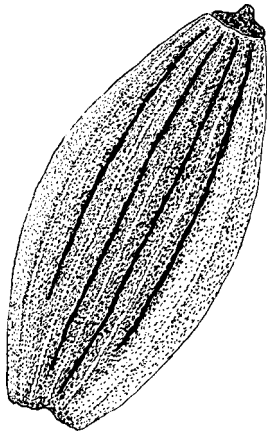
branched above. **Fruits polachenarium, broad ellipsoid, flattish, dorsal side with five ridges (the lateral wing-shaped), ventral side with two vittae (c. 2/3 of the mericarp), 7-8 x 5-6 mm. Surface dull to lustrous, glabrous, pinkish-brown, vittae dark-brown. 2n = 22.** Since the Neolithic cultivated as a vegetable, naturalized on meadows and pastures; throughout the Carpathians.

**2347. *Pastinaca sylvestris*** Miller — Biennial, stems up to 100 cm high, erect, angular, hairs on stem soft and flexuous, terminal umbel usually with 9-20 unequal rays. **Fruits polachenarium, broad elliptical, lateral wings 0.3-0.5 mm, 3 intermediate ribs thin, 6-7 x 4-5 mm. Surface smooth, dull, pale-brown, vallecule and vittae thin, dark-brown. 2n = 22.** Native to Eurasia, on dry meadows and pastures. Mo, Sk, Uk.

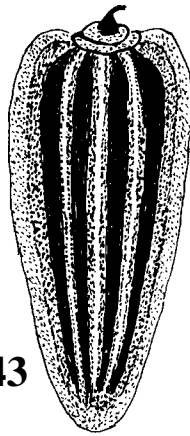
**2348. *Heracleum carpaticum*** Porc., *H. alpinum* Baumg. et auct. — Perennial, stems hirsute, low, 20-50 cm, slender, simple or with 1-2 shoots. **Fruits polachenarium, broad obovate to suborbicular, flattish, three ridges on dorsal side filiform, lateral ridges winged, ventral side mostly without vittae, 8-10 x 6.5-7.5 mm. Surface dull, glabrous or puberulent, straw-brown, vittae and vallecule dark-brown.** Native to East Carpathians grassy slopes in subalpine and alpine zones. Pl, Ro, Uk.

**2349. *Heracleum mantegazzianum*** Sommier et Levier, *H. caucasicum* Steven, *H. giganteum* Hornem — Biennial, stems up to 5 m high, reddish-spotted below. **Fruits polachenarium, broad obovoid to elliptic, flattish, dorsal side with weak visible filiform ridges, lateral ridges winged, ventral side with two vittae nearly to half of the mericarp, strong swollen, 15-18 x 7-8 mm. Surface glabrous or hairy to bristly, yellowish-brown, vittae dark-brown. 2n = 22.** Originally growing in southeastern Asia, cultivated in parks, often naturalized on brookbanks.

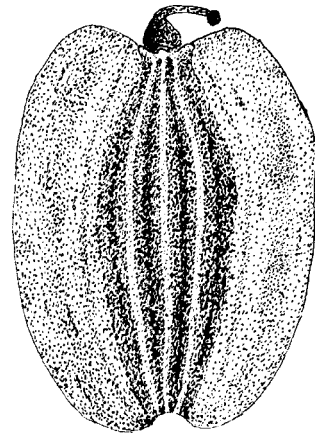
**2350. *Heracleum palmatum*** Baumg., *H. transsilvaticum* Schur — Perennial, a robust plant, stems up to 2 m high, erect, angular, branched. **Fruits polachenarium, broad obovoid, flattish, ridges indistinct, strong vallecule on dorsal side c. 3/4, vittae on ventral side c. half of the mericarp, 10-12 x 7-8 mm. Surface lustrous, bare or puberulent, pale-brown, the vittae and vallecule dark-brown.** Native to southeastern Carpathians, on moun-



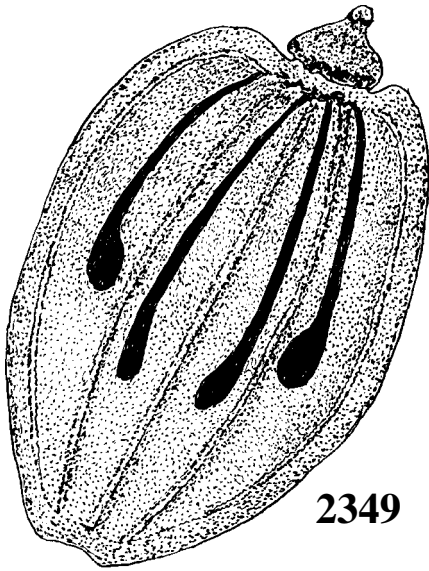
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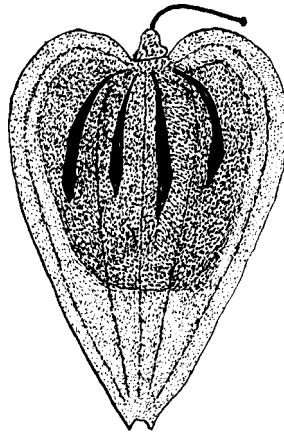
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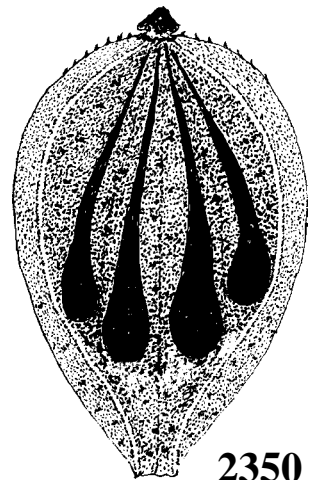
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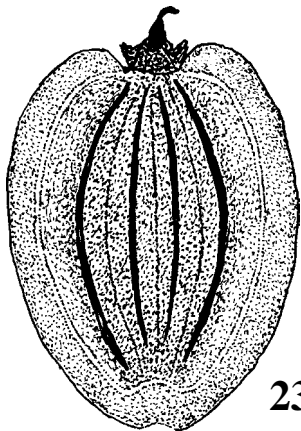
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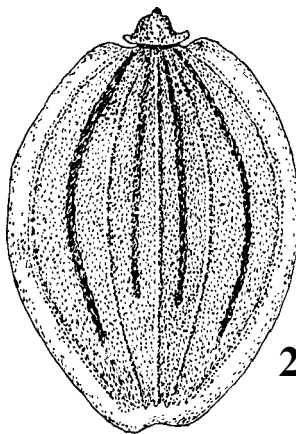
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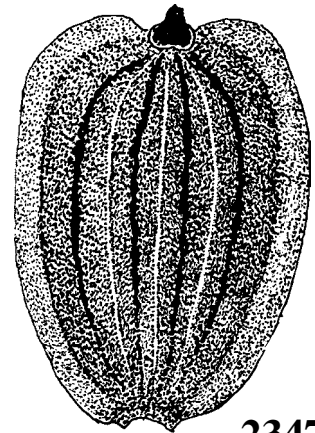
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tain meadows, wet stony slopes and forest clearings. Pl, Ro, Uk.

**2351. *Heracleum pubescent*** (Hoffm.) M. Bieb. — Annual to biennial, stems 60-80 cm. **Fruits polachenarium, obovoid to ellipsoid, flattish, dorsal side with 3 invisible or very weak visible intermediate ridges, lateral ridges winged, ventral side with 2 vittae up to half of the mericarp, 11-14 x 7-9 mm. Surface scarce prickly, dull, yellowish light-brown, vittae dark-brown.** Native to the Crimea; very rarely cultivated in parks and occasionally naturalized.

**2352. *Heracleum sibiricum*** L., *H. sphondylium* var. *sibiricum* Schmalh., *H. flavescens* Bess. — Perennial, stems 50-150 cm high, hirsute, erect, branched. **Fruits polachenarium, obovoid, dorsal side convex, with 3 ridges and 4 valleculeae, ventral side concave with a longitudinal ridge and 2 vittae, 5.5-6.5 x 3.7-4.3 mm. Surface glabrous, lustreless, whitish-yellow.** Native to Eurasia and northern Africa, as a weed in woods, shrubberies, meadows and fields. Hu, Mo, Pl, Uk.

**2353. *Heracleum sphondylium*** L. — Perennial, stems 50-250 cm high, hairy or bare, hollow, grooved, ramified. **Fruits polachenarium, broad elliptic to circular, flattish, three dorsal intermediate ridges filiform, two lateral ridges broad winged with vascular bundles, valleculeae reaching c. 3/5 of the mericarp, ventral side with 2 vittae reaching c. half of the mericarp, 5.6-6.4 x 4.7-5.3 mm. Surface glabrous, dull, straw-yellow, vittae blackish-brown. 2n = 22.** Native to European wet meadows, coastal shrubberies, forest edges, in the whole Carpathians in some subsp. Hu, Pl, Ro, Sk, Uk.

**2354. *Tordylium maximum*** L., *Heracleum tordylium* Spreng. — Annual to biennial, stems erect, 30-100 cm high, grooved, hollow, ramified. **Fruits polachenarium, circular to elliptic, flattish, dorsal side without visible ridges, valleculeae leading from the apex to the base, ventral side with two vittae, 4.4-4.8 x 4-4.4 mm. Surface setaceous, wing with a thin inner part. 2n = 20.** Native to Eurasia, on sunny stony and shrubby slopes and vineyards. Hu, Mo, Pl, Ro, Sk, Uk.

**2355. *Laser trilobum*** (L.) Borkh., *Siler trilobum* (L.) Crantz — Perennial, stems erect, 40-120 cm high, grooved, little ramified. **Fruits polachenarium,**

**prolonged ellipsoid, flattish, slight curved, dorsal side with five primary and four secondary ridges, ventral side with two broad vittae, 7-8 x 3-4 mm. Surface glabrous, smooth, brown, vittae dark-brown, ridges paler. 2n = 22.** Native to Eurasia, on shrubby slopes, in light forests, vineyards and forest steppes. Hu, Mo, Ro, Sk, Uk.

**2356. *Laserpitium siler*** L., *Siler montanum* Crantz — Perennial, glabrous, stems 30-150 cm high, terete, striate, simple or branched above. **Fruits polachenarium, oblong or ellipsoid, dorsal side with two winged and three unwinged ridges, lateral ridges broader (up to 1 mm wide), ventral side flat, with two longitudinal vittae, 8-10 x 4.2-4.8 mm. Surface lustrous, ridges pale-brown, the rest dark-brown.** Native to southern and southcentral European sunny, stony and shrubby slopes in upland zone, in the Carpathians cultivated as a medicinal plant in the past. Pl, Ro.

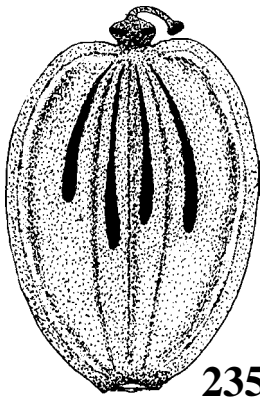
**2357. *Laserpitium alpinum*** Waldst. et Kit. — Perennial, 15-40 cm high, stems erect, branched above, fine striate, glaucous. **Fruits polachenarium, ellipsoid, two intermediate ridges nearly as broad as the marginal wings, both are broad and waved, valleculeae and vittae are not visible, 7-9 x 9.5-5.5 mm. Surface smooth, lustrous, pale-brown.** Native to Europe (Balkan-Carpathian endemic), in alpine planes and shrubberies. Pl, Uk.

**2358. *Laserpitium archangelica*** Wulfen — Perennial, stems 80-150 cm high, hollow, grooved, ramified. **Fruits polachenarium, broad ellipsoid, dorsal intermediate ridges narrow to filiform, lateral ridges very broad (up to 2 mm), 9-10 x 6.2-7.2 mm. Surface brown, ridges smooth, lustrous, yellowish.** Native to the Carpathian mountain meadows and coastal shrubberies and wet screes. Pl, Ro, Sk.

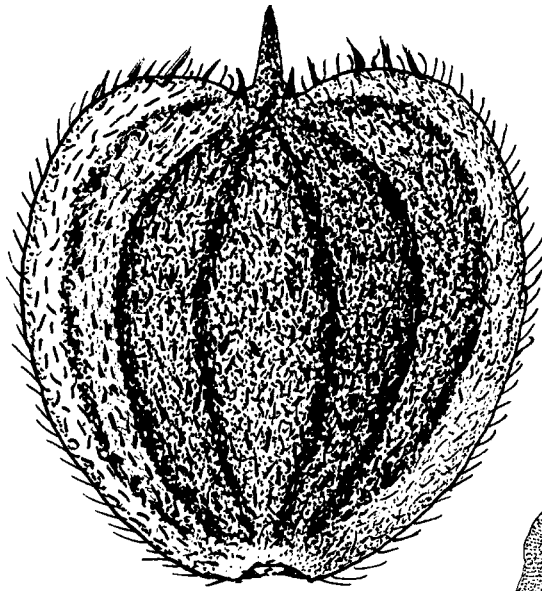
**2359. *Laserpitium krapfii*** Crantz, *L. marginatum* Waldst. et Kit. — Perennial, stems 10-120 cm high, erect, glabrous, grooved, ramified above. **Fruits polachenarium, broad elliptic, 2 dorsal ridges, narrow (1-1.5 mm), lateral wings wider than dorsal ridges, ventral side flat, 7-9 x 5.4-5.8 mm. Surface glabrous, pale- (wings) or dark-brown.** Native to mountains of Europe, on rocky, grassy slopes, forest edges, in montane and subalpine zones. Pl, Ro.

**2360. *Laserpitium latifolium*** L. — Perennial, stems erect, 50-150 cm high, grooved, full, ramified. **Fruits polachenarium, broad ellipsoid, flattish, dorsal**

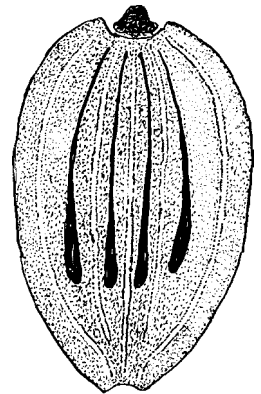




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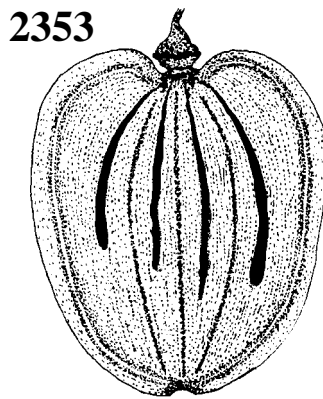
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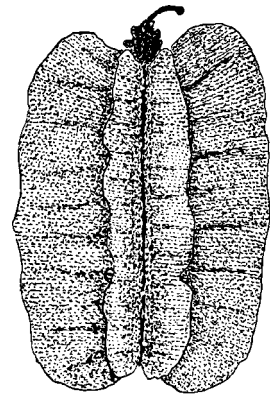
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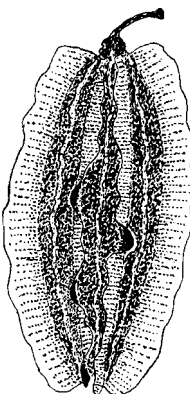
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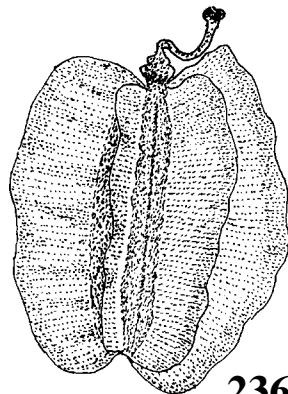
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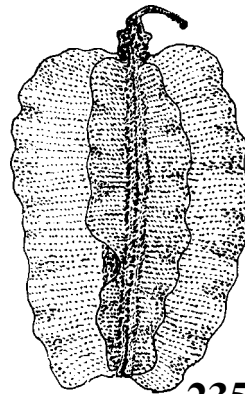
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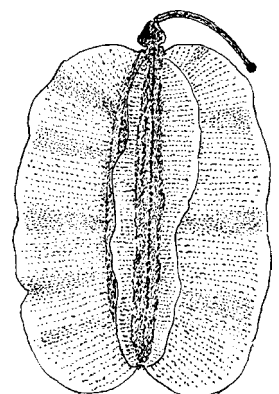
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side with two wing-like ridges, lateral side with two broad ridges, ventral side flat, vittae invisible, 6-8 x 5.5-6.5 mm. Surface dull to lustrous, light-brown.  $2n = 22$ . Native to European shrubby slopes, forest steppes and scree forests; throughout the Carpathians.

**2361. *Laserpitium pruthenicum* L., *L. hirsutum* Gilib.** — Annual up to perennial, stems slender, erect, 30-100 cm high, stiff, ramified above. **Fruits polachenarium, broad ellipsoid, dorsal side with two winged and three unwinged ridges, lateral ridges are broader, ventral side with two vittae, 6.5-7.5 x 4-5 mm. Surface dark-brown, valleculeae and vittae areas rough, scarce hairy, wings light-brown.  $2n = 22$ .** Native to European wet and swampy meadows, coastal shrubberies and light forests. Br, Hu, Pl, Ro, Sk, Uk.

**2362. *Daucus broteri* Ten.** — Annual, stems 15-50 cm high, erect or ascending, much branched from the base, retrorse-scabrid or hispid near the base. **Fruits polachenarium, ellipsoid, spines on secondary ridges of the dorsal side about as long as the mericarp width, strong dilated and confluent at the base, ventral side with two hairy ridges and a furrow in the middle, 3.8-4.2 x 2-2.8 mm. Surface faint lustrous, pale-brown.** Native to the Balkan Peninsula, on tilled fields and seashores. Ro.

**2363. *Daucus carota* L.** — Annual to biennial, stems erect, 30-80 cm high, bristly hirsute, sometimes ramified above. **Fruits polachenarium, ellipsoid, three non-spiny ridges on dorsal side and two on ventral side, four secondary ridges with the spines on dorsal side, ventral side flat, 4-5 x 2.5-3.5 mm (with spines). Surface dull, vittae invisible, orange-brown.  $2n = 18$ .** Native to Eurasia, on dry meadows and pastures, at light forest edges, fallows, sand-loamy soils; throughout the Carpathians.

**2364. *Daucus guttatus* Sibth. et Sm., *D. bicolor* Sibth. et Sm., *D. setulosus* Guss. ex DC.** — Annual, stems 20-60 cm, erect or ascending, retrorse-scabrid or hispid near the base. **Fruits polachenarium, ellipsoid, on dorsal side with spines, the secondary ridges 1-2 times as long as the width of the mericarp, ventral side with longitudinal furrows and 2 ribs, 2.5-2.9 x 1.2-1.4 mm. Surface dull, hairs whitish, back dark-brown, tummy pale-brown.** Native to Balkan Peninsula on dry hillsides, especially near the sea. Ro.

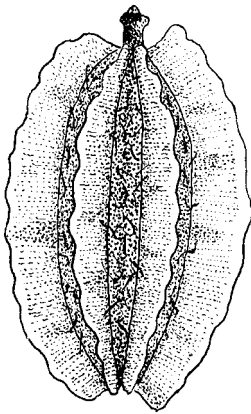
**2365. *Orlaya grandiflora* (L.) Hoffm., *Caucalis grandiflora* L.** — Annual, stems erect, 10-50 cm high, glabrous, angular, sometimes ramified. **Fruits polachenarium, ovoid to ellipsoid, dorsal side slight convex, five primary ridges (three on dorsal side and two on lateral side) with short bristles, four secondary ridges with spines on dorsal side, ventral side flat, 8-9 x 4.4-5 mm.  $2n = 20$ .** Native to European sunny, stony and shrubby slopes, forest steppes, fields and vineyards. Hu, Ro, Sk.

**2366. *Turgenia latifolia* (L.) Hoffm., *Caucalis latifolia* (L.) L.** — Annual, bristles hirsute, stems erect, 10-60 cm high, grooved, sparsely branched. **Fruits polachenarium, prolonged ovoid, apex bristly, dorsal side dense spinose on primary and secondary ridges, ventral side flat with longitudinal furrow, 8-10 x 5-6 mm (with spines). Surface faint lustrous, greyish-brown.  $2n = 32$ .** Native to Eurasia, in fields, vineyards, ruins and on stony slopes. Hu, Mo, Ro, Sk, Uk.

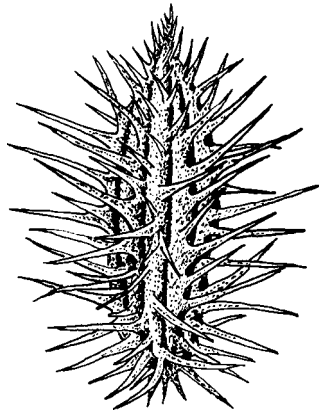
**2367. *Caucalis platycarpus* L. subsp. *muricata* (Čelak.) Holub** — Perennial, stem erect, 10-20 cm high. **Fruits polachenarium, oblong obovoid, planoconvex, with short thorns or blunt excrescences in longitudinal ridges, apex with beak, 9-10 x 3-3.5 mm. Surface smooth, faint lustrous, pale-brown.** Native to southeastern Europe, in forest steppes, on dry slopes. Hu, Mo, Pl, Ro, Sk.

**2368. *Caucalis platycarpus* L. subsp. *platycarpus*, *C. lappula* (Weber) Grande, *C. daucooides* L.** — Annual, slight setose or pubescent, stems erect or ascendent, 10-30 cm high, branched. **Fruits polachenarium, prolonged ellipsoid, five primary ridges sparse hairy, four secondary ridges with long (up to 3 mm) spines, ventral side flat, 8-10 x 3-4 mm. Surface dull, smooth, brown, spines light-brown.  $2n = 20$ .** Native to European fields, ruins, embankments and vineyards. Hu, Pl, Ro, Sk, Uk

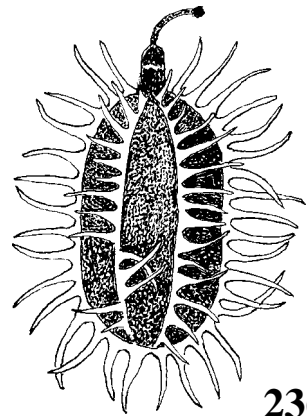
**2369. *Astrodaucus orientalis* (L.) Drude, *Caucalis orientalis* L.** — Biennial, stems erect, 50-100 cm high, glabrous, branched above. **Fruits polachenarium, prolonged ellipsoid, secondary ridges with two rows of long triangular spines, five primary ridges with very short spines, ventral side concave with deep longitudinal furrow, 5.5-6.5 x 3.5-4.5 mm (with spines). Surface asteroid downy, light-brown.  $2n = 20$ .** Originally growing in Asia, rarely hauling into Europe and naturalized. Uk.



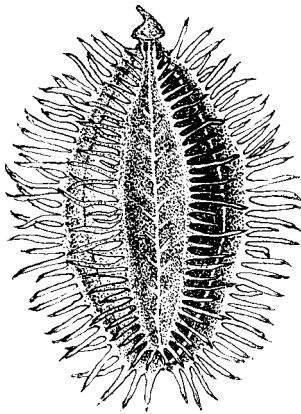
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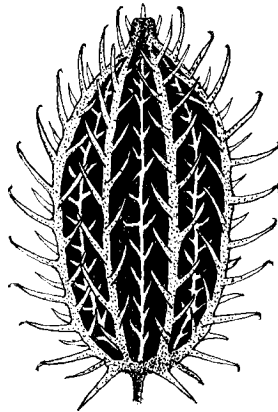
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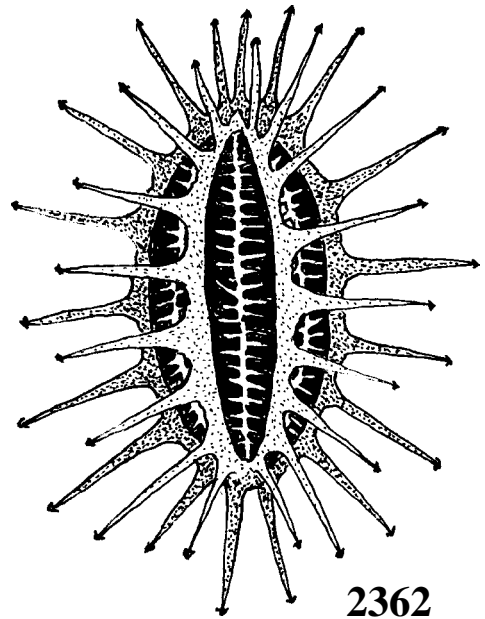
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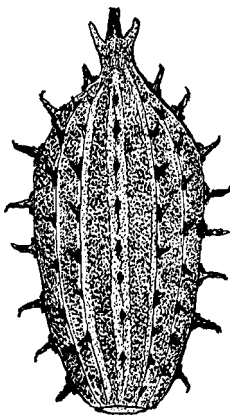
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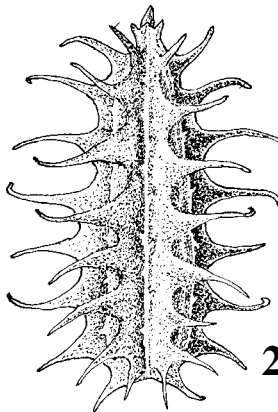
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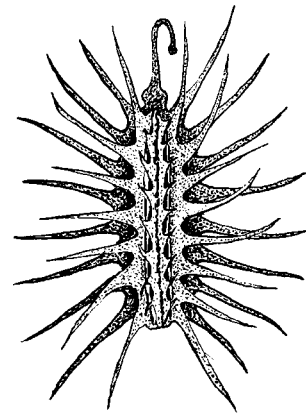
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**2370. *Torilis arvensis*** (Huds.) Link, *Caucalis arvensis* Huds. — Annual, stems 20-100 cm, grooved, bristly, ramified below. **Fruits polachenarium, narrow ovoid, slight compressed, the whole dorsal side surface covered with long, straight or arching, papillose spines up to 1 mm long, ventral side flat, on the border (primary ridges) with fine short spines, 4-5 x 1.8-2.2 mm (with spines). Surface dull, tuberculate and aculeate, greyish-brown, spines pale. 2n = 12.** Native to Eurasia, in fields, dry stony places, fallows and vineyards. Hu, Mo, Ro, Sk, Uk.

**2371. *Torilis japonica*** (Houtt.) DC., *T. rubella* Moench — Annual to biennial, stems erect, 30-120 cm high, grooved, bristly hirsute, reddish, ramified. **Fruits polachenarium, narrow ovoid, flattish, dorsal side convex, secondary ridges dense covered with precurved spines, primary ridges covered with shorter spines, ventral side with a longitudinal suture, 4.5-5.5 x 2.4-2.8 mm (with spines). Surface dull, greyish-brown, spines light grey. 2n = 16.** Native to Eurasia, on sunny, shrubby slopes, at forest edges and vineyards. Hu, Mo, Pl, Ro, Sk, Uk.

**2372. *Torilis leptophylla*** (L.) Rchb. fil., *T. xanthotricha* (Stev.) Schischkin — Annual, stems erect, sometimes branched. **Fruits polachenarium, linear-cylindric, dorsal side with 4 secondary ridges bearing very long spines, the primary ridges between them with short, adpressed hairs, ventral side concave with two vittae, 6-7 x 3-3.6 mm (with spines). Surface scabrous, greyish- or brownish. 2n = 12.** Native to southern Europe, on slopes, screes, fields and in waste places, often hauling into the Carpathians. Uk.

**2373. *Torilis nodosa*** (L.) Gaertn., *Tordylium nodosum* L. — Annual, stems procumbent, tufted, 10-50 cm high, grooved, roughly hirsute, simple. **Fruits polachenarium, usually composed of two different mericarps, the outer with long, papillose spines arranged in 9 obscure rows, and with short adpressed setae in the intervals between the 5 primary rows, 4.5-5 x 2.2-2.5 mm (with spines). Surface of inner mericarp usually covered with short, conical papillose tubercles. 2n = 22.** Native to southwestern Europe; rarely hauling into the fields of the Carpathians. Ro, Uk.

**2374. *Chaerophyllum aromaticum*** L. — Perennial, stems erect, up to 200 cm high, ramified, bristly and reddish-spotted, grooved below. **Fruits polachenarium, narrow ovate, basal part of style**

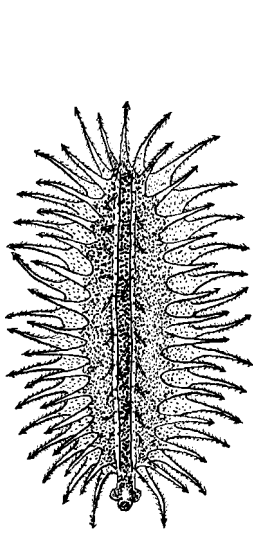
**depressed-conical, wider than apex of the mericarp, dorsal surface with five ridges and four furrows, ventral side concave, 9-12 x 2-2.6 mm. Surface smooth, lustreless, brown. 2n = 22.** Native to Europe, in shady moist forests, coastal shrubberies and meadows. Hu, Mo, Pl, Ro, Sk, Uk.

**2375. *Chaerophyllum aureum*** L. — Perennial, stems erect, 60-150 cm high, angular, bristly, grooved, downy, reddish-spotted below. **Fruits polachenarium, prolonged ovoid, basal part of style conical, dorsal side convex with five ridges and four furrows, ventral side concave, 10-13 x 1.5-1.8 mm. Surface lustrous, smooth, pale-brown to brown. 2n = 22.** Native to European shady moist forests and shrubberies, rocky slopes, open grassy meadows. Hu, Ro, Sk, Uk.

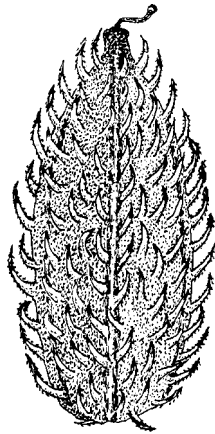
**2376. *Chaerophyllum bulbosum*** L. — Annual to biennial, stem erect, 50-200 cm high, grooved, hollow, bristly, reddish-spotted, ramified. **Fruits polachenarium, narrow ovoid, basal part of style conical, wider than the apex, dorsal side convex with five ridges and four furrows, ventral side concave, 4.5-5.5 x 1-1.5 mm. Surface smooth, slight lustrous, valliculae blackish-brown, ridges pale-brown. 2n = 22.** Native to Eurasia, on sunny and coastal shrubberies, at forest edges and stony overgrown slope. Hu, Mo, Pl, Ro, Sk, Uk.

**2377. *Chaerophyllum hirsutum*** L., *Ch. cicutaria* Vill. — Perennial, stems erect or ascendent, 40-120 cm high, hollow, grooved, branched. **Fruits polachenarium, narrow ovoid-oblong, tapering gradually upwards, styles nearly erect, 9-12 x 1.1-1.5 mm. Surface of valliculae brown, five ridges yellowish-brown. 2n = 22.** Native to European shady and moister forests, lowland forests, coastal shrubberies and meadows. Br, Hu, Pl, Ro, Sk, Uk.

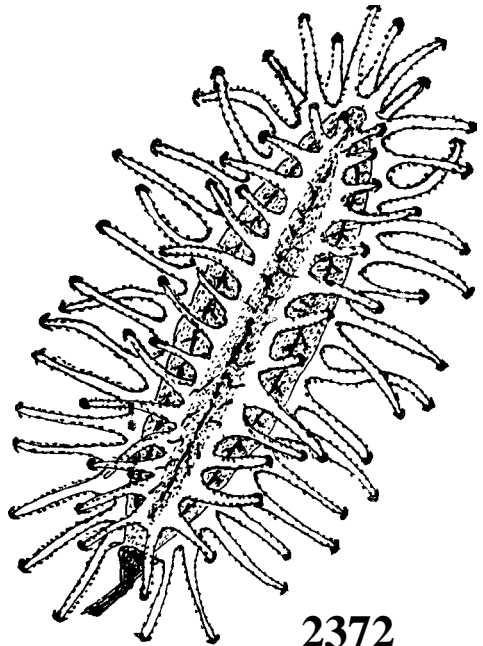
**2378. *Chaerophyllum prescottii*** DC. — Biennial, stems 50-180 cm high, grooved, with reddish spots, hirsute below, glabrous above. **Fruits polachenarium, prolonged ovoid, basal part of style conical, as wide as the apex, dorsal side convex with five ridges and four furrows, ventral side convex, 6-8 x 0.9-1.2 mm. Surface smooth, slight lustrous, furrows blackish-brown, ridges yellowish-brown.** Native to Eurasia, on grassy slopes, in waste places and clearings, as a weed in fields and embankments. Mo, Ro, Uk.



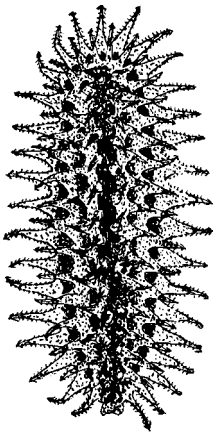
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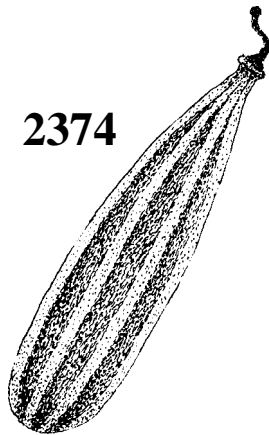
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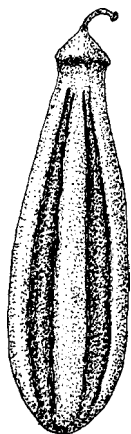
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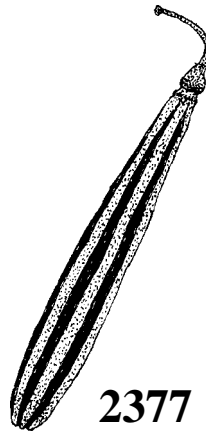
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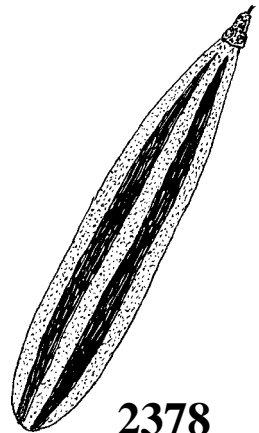
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**2379. *Chaerophyllum temulum* L., *Ch. temulentum* L.** — Annual to biennial, stems erect, 20-100 cm high, grooved, below roughened with knobs, setose, ramified. **Fruits polachenarium, prolonged ovoid, basal part of style about as wide as the apex, dorsal side convex with five ridges and four furrows, ventral side concave, 5-6 x 0.9-1.2 mm. Surface smooth, lustrous, furrows dark-brown, ridges yellowish-brown. 2n = 14 (22).** Native to European shrubberies, forest edges, gardens, lowland forests, abundant; throughout the Carpathians.

**2380. *Anthriscus caucalis* (M. Bieb.), *A. scandicinus* (Weber) Mansf., *Caucalis scandicina* Weber** — Annual, stems erect or ascendent, 10-100 cm high, reddish, little ramified below. **Fruits polachenarium, prolonged ovate, dorsal side convex, ventral slight flat with suture, neck c. 1/5-1/4 of the mericarp, 3-3.5 x 0.8-1.1 mm. Surface dull, spiny, nut- to grey-brown. 2n = 14.** Native to European waste places, roads, vineyards and ruins. Hu, Pl, Ro, Sk, Uk.

**2381. *Anthriscus cerefolium* (L.) Hoffm., *Scandix cerefolium* L.** — Annual, a fragrant plant, stems erect, 10-70 cm high, crooked, sparsely ramified. **Fruits polachenarium, seed-bearing part prolonged ovate, dorsal side convex, ventral side with a deep furrow, neck c. 1/3 of the mericarp, 7.5-9.5 x 0.8-1.2 mm. Surface smooth to fine verrucose or spined (subsp. *trichospermum*), lustrous, dark- to black-brown. 2n = 18.** Native to Europe, espec. Eurasia, in pastures, gardens, vineyards and on overgrown slopes, in the past cultivated (subsp. *cerefolium*) as a vegetable, often naturalized. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**2382. *Anthriscus cerefolium* subsp. *trichospermus* (Schult.) Arcang., *A. longirostris* Bertol** — Annual, up to 70 cm high, leaves 3-pinnate, with pinnatifid lobes, rays 2-6,  $\pm$  pubescent. **Fruits polachenarium, oblong, cylindric, planoconvex, with a long thin beak, 8-9 x 0.7-0.8 mm. Surface warty, each wart with a bristle, dull, black. 2n = 18.** Native to south-eastern Eurasia, on disturbed grounds, in pastures, vineyards, gardens, overgrown slopes and uplands. Ro, Sk, Uk.

**2383. *Anthriscus nemorosa* (M. Bieb.) Sprengel, *Chaerophyllum nemorosum* M. Bieb.** — Perennial, stems full, grooved, 50-120 cm high, ramified. **Fruits polachenarium, prolonged cylindric, dorsal side convex, ventral side with suture, gradually narrowed towards the apex, neck very short, 8-9 x**

**1.4-1.6 mm. Surface covered with short, whitish spines, lustrous, rest of them dark-brown.** Native to European damp meadows, orchards, parks, light forests, shrubberies and field edges. Ro, Uk.

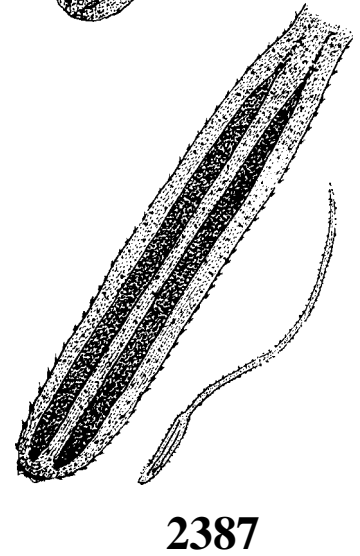
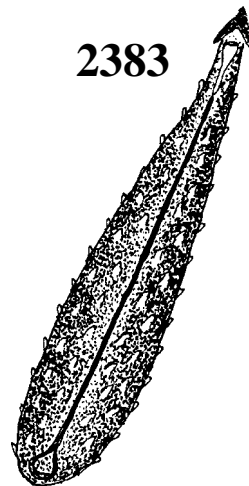
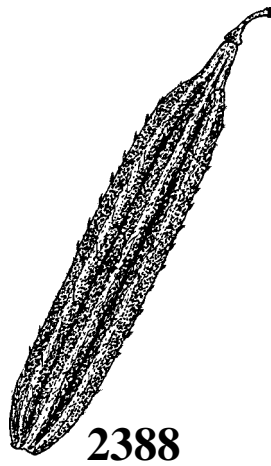
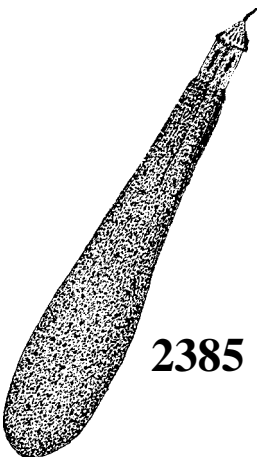
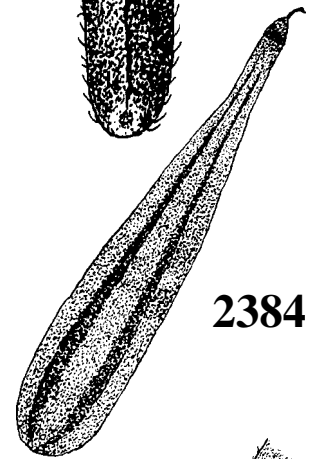
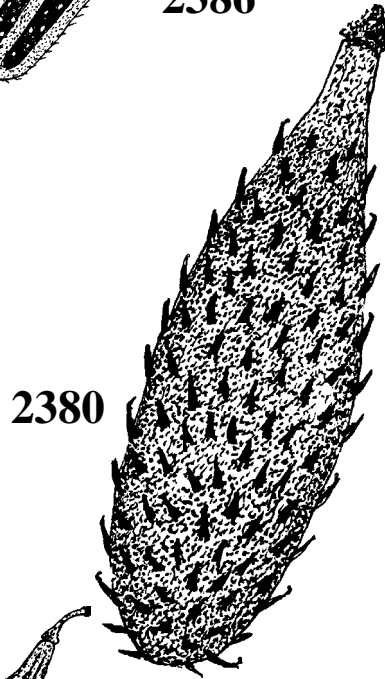
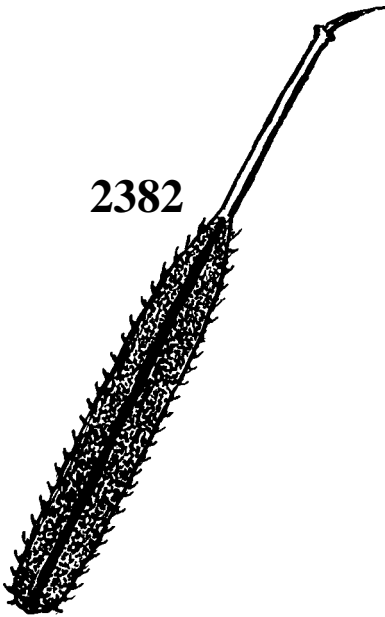
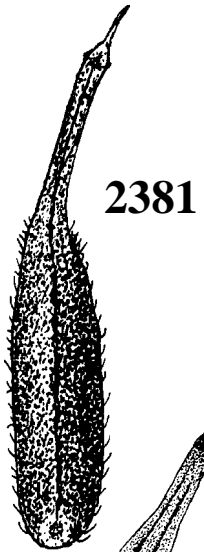
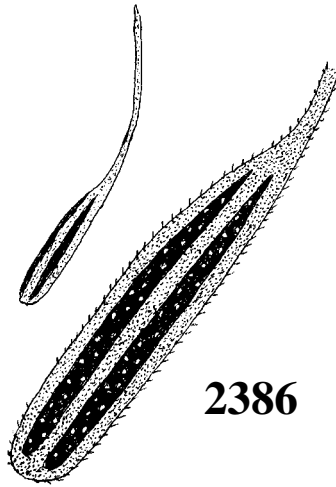
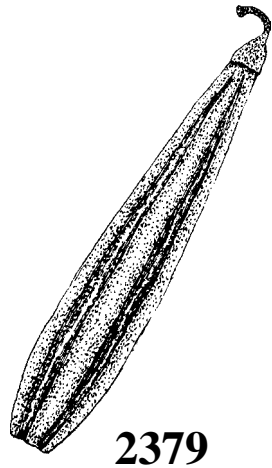
**2384. *Anthriscus nitidus* (Wahlenb.) Hazsl., *Chaerifolium nitidum* (Wahlenb.) Domin** — Perennial, stems 10-50 cm high, full grooved, ramified, downy below. **Fruits polachenarium, prolonged ovoid or cylindric, with five low ridges on dorsal convex side, ventral side with distinct furrow, 4.5-6 x 0.9-1.2 mm. Surface lustrous, fine verrucose, smooth, blackish, ridges yellowish-brown. 2n = 18.** Native to Europe, in forests, coastal shrubberies, mountain meadows. Hu, Pl, Ro, Sk, Uk.

**2385. *Anthriscus sylvestris* (L.) Hoffm., *Cerefolium sylvestre* (L.) Besser** — Biennial to perennial, stems erect, 30-150 cm high, sharply ribbed, bristly, ramified. **Fruits polachenarium, prolonged ovoid with a long neck (1/8-1/6 of the mericarp), dorsal side convex, ventral side with longitudinal furrow, stylopodium conical, 5.5-6.5 x 1.9-2.3 mm. Surface smooth, areolate, lustrous, olive- to blackish-brown. 2n = 16.** Native to Eurasia, on wet meadows, in forests, shrubberies, ruins. Hu, Mo, Pl, Ro, Sk, Uk.

**2386. *Scandix australis* L., *S. falcata* Lond.** — Annual, stems pubescent or glabrous, ramified, 30-60 cm high. **Fruits polachenarium, narrow cylindric, curved, compressed, dorsal side with 5 ridges, ventral side with a groove, beak 1-3 times the fertile portion, 10-30 x 1-1.2 mm. Surface glabrous, asperous or dense hispid, often falcate, pale- to blackish-brown.** Native to the Mediterranean, on dry slopes, stony steppes, ways edges and in ruderal places. Ro.

**2387. *Scandix pecten-veneris* L.** — Annual, stems erect, 10-30 cm, fine grooved, ramified, glabrous to bristly. **Fruits polachenarium, narrow elliptic to ovoid, flattish, dorsal side with five broad and low ridges without bristly spines, ventral side with longitudinal groove, apex with a beak, usually longer than the seed-bearing part, 10-15 x 2.2-4 mm (seed-bearing part, beak c. 3-4 cm). Surface dull, spiny, pale- to dark-brown. 2n = 16, 26.** Native to Eurasia, in fields, fallows, vineyards, ruins and dry, stony, calcareous stands. Hu, Pl, Ro, Sk, Uk.

**2388. *Myrrhis odorata* (L.) Scop., *Scandix odorata* L.** — Perennial, stems erect, 50-200 cm high, hollow, ramified above. **Fruits polachenarium, prolonged**



ellipsoid, slight curved, five prominent keeled ridges on dorsal side, ventral side with concave furrow, beaked, 22-28 x 3-4 mm. Surface glossy, with bristly hairs, olive- to blackish-brown.  $2n = 22$ . Native to the Alps; in the Carpathians in the past cultivated as a spice and medicinal plant, naturalized in mountain meadows. Pl, Sk, Uk.

**2389. *Myrrhoides nodosa* (L.) Cannon, *Scandix nodosa* L., *Physocaulis nodosus* (L.) Koch** — Annual up to perennial, stem under the knot rough, bristly hirsute. **Fruits polachenarium, linear-ellipsoid, apex constricted into style, base truncate, 9-12 x 2-2.4 mm. Surface covered with very low spines, dull, reddish- or greyish-brown.  $2n = 22$ .** Native to the Mediterranean; hauling into the Carpathians. Hu, Ro, Sk, Uk.

**2390. *Pleurospermum austriacum* (L.) Hoffm., *Ligusticum austriacum* L.** — Biennial up to perennial, stems erect, 50-150 cm high, hollow, grooved, ramified, downy. **Fruits polachenarium, ellipsoid to ovoid, dorsal side with five vexillary ridges, ventral side flat, 7.5-10 x 4-4.5 mm. Surface dull, glabrous, scarce tuberculate, ridges margin crenate, yellowish.  $2n = 22$ .** Native to Eurasia, in wet forests, on overgrown rocks and mountain meadows. Br, Hu, Pl, Ro, Sk, Uk.

**2391. *Prangos carinata* Gris., *P. ferulacea* (L.) Lindley** — Perennial, stems, angular, ramified, 60-150 cm high, with rest of the old leaves at the base. **Fruits polachenarium, suborbicular, dorsal side convex, strong ridged but unwinged, straight or slight distinct undulate, ventral side flat apex narrowed, base truncate, 16-20 x 12-14 mm. Surface smooth or slight roughened, dull, lustreless, faint brown.** Native to southeastern Eurasia, on rocky slopes and in arid grassy places. Ro.

**2392. *Conium maculatum* L.** — Annual up to biennial, stems erect, 50-200 cm high, hollow, grooved, glabrous, reddish-brown spotted, ramified. **Fruits polachenarium, broad ovoid, slight curved, dorsal side with five distinct ridges, often wavy, ventral side flat with a shallow longitudinal groove, stylopodium short conical, 3-3.5 x 1.6-2 mm. Surface dull, glabrous, light-brown (ridges) to dark-brown.  $2n = 22$ .** Native to Eurasia, on shrubby slopes, overgrown rocks and stone-pits, ruins and in waste places, at fences and walls, in warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**2393. *Smyrniolus olusatrum* L.** — Biennial, glabrous, stem 50-150 cm high, stout, solid, becoming hollow when old, upper branches often opposite. **Fruits polachenarium, ellipsoid with three ridges on dorsal side, ventral side rooflike, flat, with longitudinal white or yellowish furrow, 6-8 x 3.4-4.2 mm. Surface wrinkly, smooth or longitudinal furrowed, lustreless, black.  $2n = 22$ .** Native to southern Europe, occurrences in South Carpathians possible (from northern Yugoslavia).

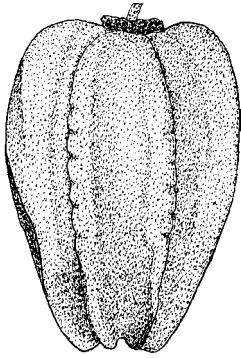
**2394. *Smyrniolus perfoliatum* L., *S. discoridis* Spreng.** — Biennial, stems erect, 50-150 cm high, winged, angular, ramified above. **Fruits polachenarium, planoconvex, with 3-5 narrow ridges, lateral surfaces of ventral side semiglobular with a rib in the middle, 2.1-3 x 2.1-2.5 mm. Surface dull, slight glittery, tuberculate, dark- to black-brown.  $2n = 22$ .** Native to the Mediterranean, in wet light forests and shrubberies. Hu, Ro, Sk.

**2395. *Coriandrum sativum* L.** — Annual, stems erect, 15-50 cm high, grooved, ramified above. **Fruits polachenarium, semiglobose, dorsal side convex, ventral side concave with ten low and narrow ridges (five primary-sinuate, five secondary-straight), 2.8-3.4 x 2.8-3.4 mm. Ventral surface roughen.** Native to the eastern Mediterranean region, long time ago cultivated in gardens as a condiment, occasionally naturalized among winter crops. Hu, Pl, Ro, Sk, Uk.

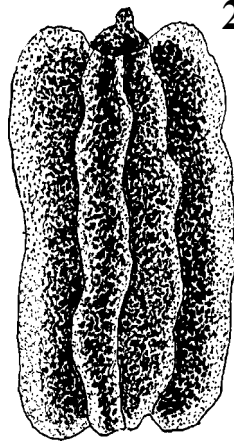
**2396. *Bifora radians* M. Bieb.** — Annual, stems erect, 15-40 cm high, glabrous, angular, leafy and ramified. **Fruits polachenarium, globular, dorsal surface inconspicuously humpy, ribs low, hilum cordate, 2.8-3.8 x 2.8-3.8 mm. Surface shallow wrinkly, roughened, dull, yellowish-brown.  $2n = 22$ .** Native to southern Europe, in fields, embankments, vineyards, in warmer areas. Hu, Pl, Ro, Sk, Uk.

**2397. *Ligusticum lucidum* Mill., *L. pyrenaicum* Gouan, *L. sequieri* Vill.** — Perennial, almost glabrous, stems up to 150 cm high, solid, with several cauline leaves, branched above. **Fruits polachenarium, ellipsoid or oblong-ovoid, dorsal side convex with 3 c. 0.5 mm broad ridges, lateral ridges a little broader, ventral side flat with longitudinal furrow, 5-6 x 2.2-3 mm. Surface smooth, faint lustrous, dark-brown, ridges pale-brown.** Native to south European mountain slopes, occurrences in the Carpathians dubious.

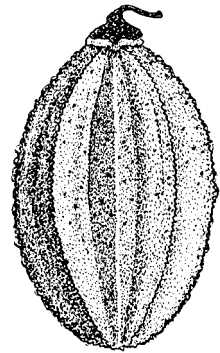




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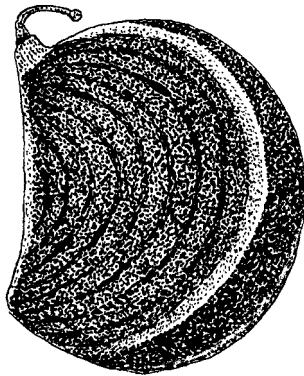
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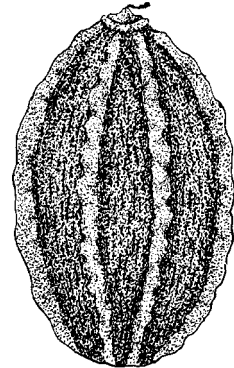
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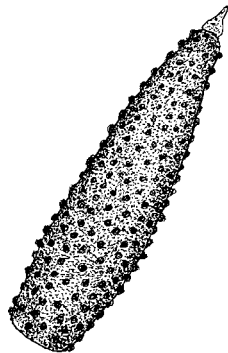
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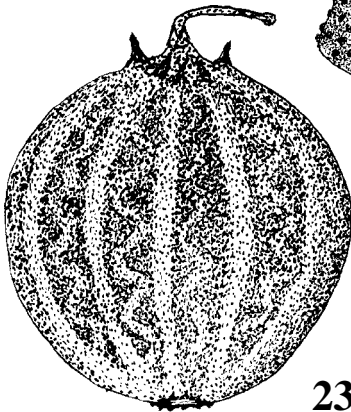
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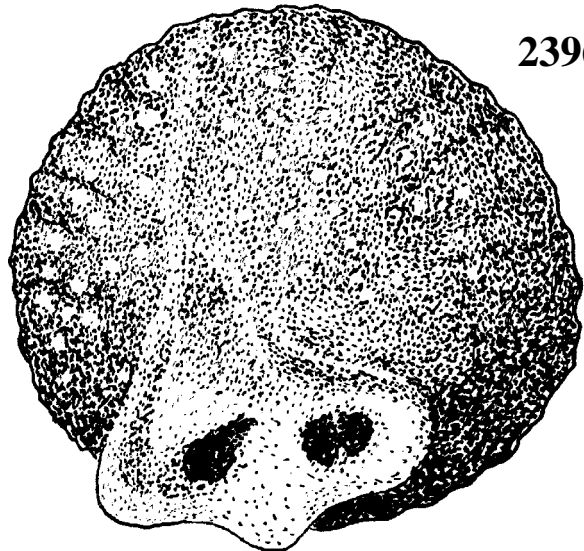
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**2398. *Ligusticum mutellina*** (L.) Crantz, *Phellandrium mutellina* L. — Perennial, stems erect or ascendent, simple, sparsely ramified above, 10-50 cm high. **Fruits polachenarium, prolonged ellipsoid or ovoid, slight flattish, dorsal side with five ridges, ventral side flat, 4.5-5 x 1.8-2.2 mm. Surface smooth, slight lustrous, brown, ridges pale.** Native to central Europe and the Balkan areas, on alpine and subalpine meadows, at altitudes up to 1500 m. Pl, Ro, Sk, Uk.

**2399. *Ligusticum mutelinoides*** (Crantz) Vill., *Laserpitium mutelinoides* Crantz — Perennial, stems 3-20 cm high, grooved, glabrous, sometimes hirsute. **Fruits polachenarium, broad ellipsoid, dorsal ridges short winged, lateral ridges broad winged, ventral side flat with the longitudinal rib in the middle, 3-4 x 2-2.5 mm. Surface longitudinal ribbed, smooth, lustreless, pale-brown.** Native to the Alps and the Carpathians on overgrown rocks in the alpine zone. Pl, Ro, Sk.

**2400. *Cachrys alpina*** M. Bieb. — Perennial, stems erect, grooved, branched above, 60-100 cm high. **Fruits polachenarium, prolonged obovoid, dorsal side convex with indistinct furrows in upper part of the fruit, ventral side flat, apex and base rounded, 15-17 x 6.4-8 mm. Surface roughen, dull, lustreless, weak sulcate, whitish or pale-brown.** Native to southeastern European on southern mountain slopes, light forests and stony places. Ro, Uk.

**2401. *Physospermum cornubiense*** (Torn.) DC., *Danaa cornubiensis* (Torn.) Burnat — Perennial, stems 50-120 cm high, erect, slender, striate, ramified. **Fruits polachenarium, ellipsoid to ovoid, dorsal side strong convex with indistinct ridges, ventral side concave, 4-4.4 x 2.1-2.4 mm. Surface glossy, smooth, glabrous, dark-brown.** Native to southern Europe, in forests, shrubberies, at woody or stony slopes. Hu, Ro, Uk.

#### 114. VIOLACEAE

**2402. *Viola alba*** Bess., *V. albiflora* Kirschl, *V. virescens* Jord. — Perennial, plant with short stolons, shoots thin and short, 5-15 cm long, creeping. **Seeds obovate, with conspicuous large aril, extending upwards and covering c. 1/2 of the raphe, free part of the aril at least 1/3 of the seed length, 2.7-3 (with aril) x 1.9-2.1 mm. Surface lustrous, distinct areolate, uniform whitish-yellow. 2n = 20.** Native to Europe, in light forest, shrubberies and warmer shady areas; throughout the Carpathians.

**2403. *Viola ambigua*** Waldst. et Kit., *V. campestris* M. Bieb. — Perennial, rhizome stout (up to 2 mm in diam.) many-headed, leaves in a poor ground rosette. **Seeds obovoid, with a large aril covering c. 1/2 of the raphe, free part of the aril at least 1/3 of the seed length, 1.8-2 x 1.1-1.5 mm. Surface lustrous, distinct areolate, whitish-yellow. 2n = 40.** Native to Europe (Pont.-Pannonia), on sunny steppe slopes, warm sand-loamy stands, shrubberies, a calcifuge. Hu, Mo, Pl, Ro, Sk, Uk.

**2404. *Viola arvensis*** Murray, *V. segetalis* Jord., *V. bicolor* Baumg. — Annual, stems ascendent to erect, shortly downy, 10-20 cm high, ramified. **Seeds obovate, basal aril covering 1/6-1/4 of the raphe, 1.6-1.8 x 0.8-1 mm. Surface glossy, mucilaginous, areolate, yellowish- or dark-brown, chalazal area usually darker. 2n = 34.** Native to Eurasia, in open and cultivated grounds, waste places, boundaries, pastures and roads; throughout the Carpathians.

**2405. *Viola biflora*** L. — Perennial, a prostrate plant with ground leaf rosette and ascendent stems, up to 20 cm high, flowers yellow. **Seeds obovate, aril covering 1/6-1/4 of the raphe, 2-2.2 x 1.2-1.4 mm. Surface dull, indistinct granulate, striate, medium-brown. 2n = 12, 28.** Native to Eurasia, in deciduous and mixed woodlands, alpine meadows and mats, mainly in the mountains with wet stony soils. Hu, Pl, Ro, Sk, Uk.

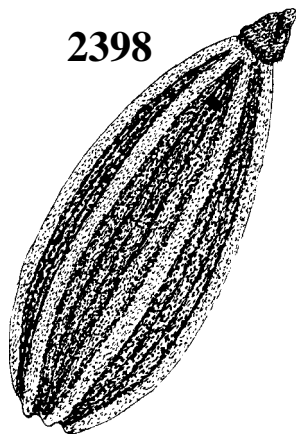
**2406. *Viola calcarata*** L. — Perennial, rhizome slender, branched, stems strong shortened up to 5 cm, sometimes longer, flowers dark-violet, rarely yellow or white. **Seeds obovate, aril 1/5-1/4 of the raphe, usually not extended the seed, 1.9-2.2 x 1-1.2 mm. Surface lustrous, distinct granulate, light to dark-brown.** Native to the Alps on meadows, pastures and screes, mostly above 1500 m altitude; cultivated in gardens. Ro.

**2407. *Viola canina*** L. — Perennial, stems decumbent, ascendent or erect, 10-40 cm long, ramified at base, flowers blue. **Seeds obovate, aril covering 1/6-1/5 of the raphe, 1.8-2 x 1-1.2 mm. Surface lustrous, distinct areolate and sometimes pustular, brown indistinct dark-brown-spotted. 2n = 40.** Native to Eurasia, on meadows, pastures, edges of woodlands, heaths, dry turfs, avoids chalky soils; throughout the Carpathians.

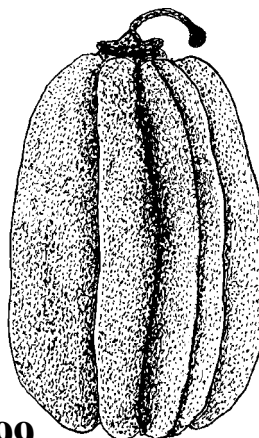
**2408. *Viola collina*** Besser — Perennial, peduncle arises from the basal rosette of leaves, flowers



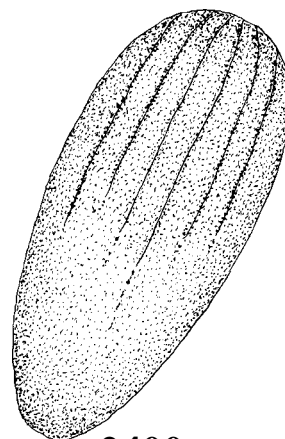
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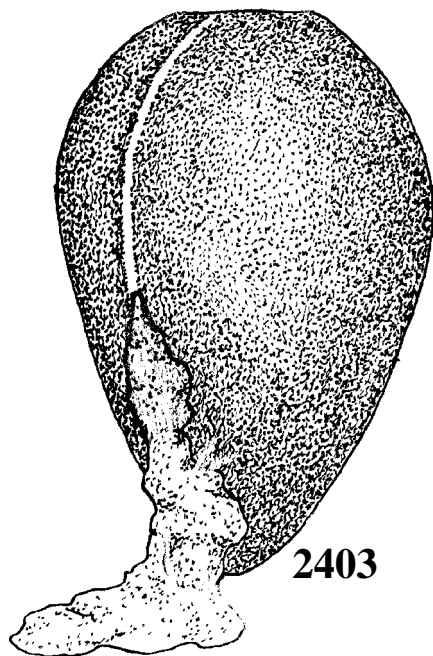
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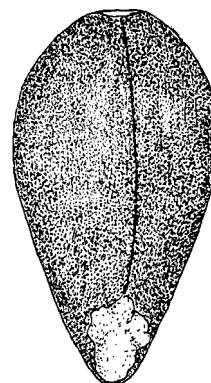
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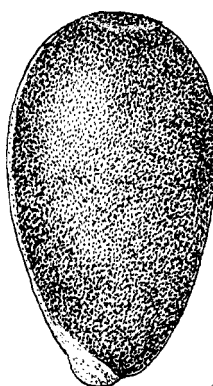
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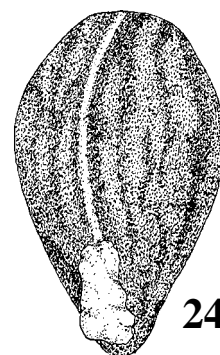
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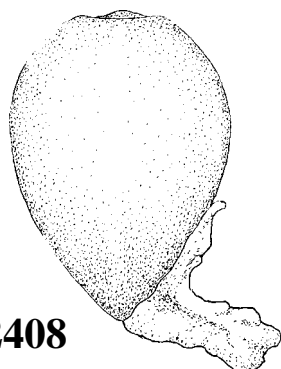
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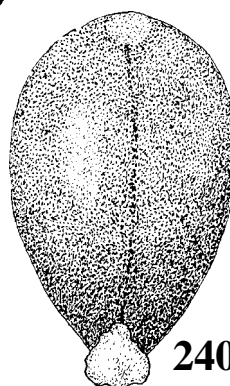
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2407

light-violet. **Seeds obovoid, aril conspicuous, basal extending upwards and covering about 1/2 of the raphe, free part of the aril at least 1/3 of the seed length, usually longer, 2-2.3 x 1.4-1.6 mm. Surface lustrous, yellowish-white. 2n = 20.** Scattered over a large part of Eurasia in light warm woodlands and shrubby slopes, usually calcicole; in all Carpathian territories.

**2409. *Viola cornuta* L.** — Perennial, stem ascendent, 20-30 cm, plant with stem leaves only, flowers on a long armpit peduncle. **Seeds obovate, aril covering c. 1/6 of the raphe, 1.6-2 x 0.8-1 mm. Surface lustrous, distinct areolate, pale- to medium-brown. 2n = 22.** Native to the Pyrenees, on alpine and subalpine meadows; often cultivated in gardens, sporadically escaping and naturalized. Ro, Sk.

**2410. *Viola cyanea* Čelak., *V. austriaca* A. Kern., *V. sepincola* subsp. *cyanea* (W. Becker) Gams** — Perennial, with leaf rosette, producing short, stout stolons, spring leaves 3-8 cm, summer leaves up to 20 cm, glabrous or hairy. **Seeds obovate, apex truncate, mighty aril covering half of the raphe, 2.5-2.7 x 1.7-1.9 mm. Surface faint lustrous, smooth, violetish and violet punctuate. 2n = 40.** Native to central and southeastern Europe. Hu, Pl, Ro, Uk.

**2411. *Viola dacica* Borbás, *V. declinata* auct. non Waldst. et Kit.** — Perennial, stems 15-35 cm, scattered hirsute or glabrescent, flower violet or yellowish. **Seeds obovate, aril covering 1/6-1/4 of the raphe, 1.6-1.9 x 0.9-1.1 mm. Surface lustrous, distinct areolate, medium-brown. 2n = 20.** Native to the Carpathians and the Balkan territories, in mountain and subalpine pastures. Pl, Ro, Sk, Uk.

**2412. *Viola declinata* Waldst. et Kit.** — Perennial, glabrous, 15-40 cm high, with leafy stolon, stems ascending, glandular above. **Seeds obovoid, with a small aril covering c. 1/4 of the raphe, apex truncate, 1.6-1.9 x 1.2-1.3 mm. Surface fine waved, faint lustrous, yellowish or brown. 2n = 26.** Native to eastern and southern Europe, on pastures and meadows, 800-2000 m. Pl, Ro, Sk.

**2413. *Viola elatior* Fr., *V. erecta* Gilib., *V. montana* Borbás** — Perennial, plant erect, 15-50 cm high, downy, unramified, without ground leaf rosette, flower pale-blue. **Seeds obovate, aril covering 1/6-1/4 of the raphe, free part of the aril less than 1/6 of the seed length, 2.1-2.4 x 1.2-1.4 mm. Surface**

**lustrous, distinct areolate, sometimes pustular, nut-brown to dark-brown. 2n = 40.** Native to Eurasia, in damp grasslands, scrubs, moist shrubberies, light forests and their edges; in all Carpathian territories.

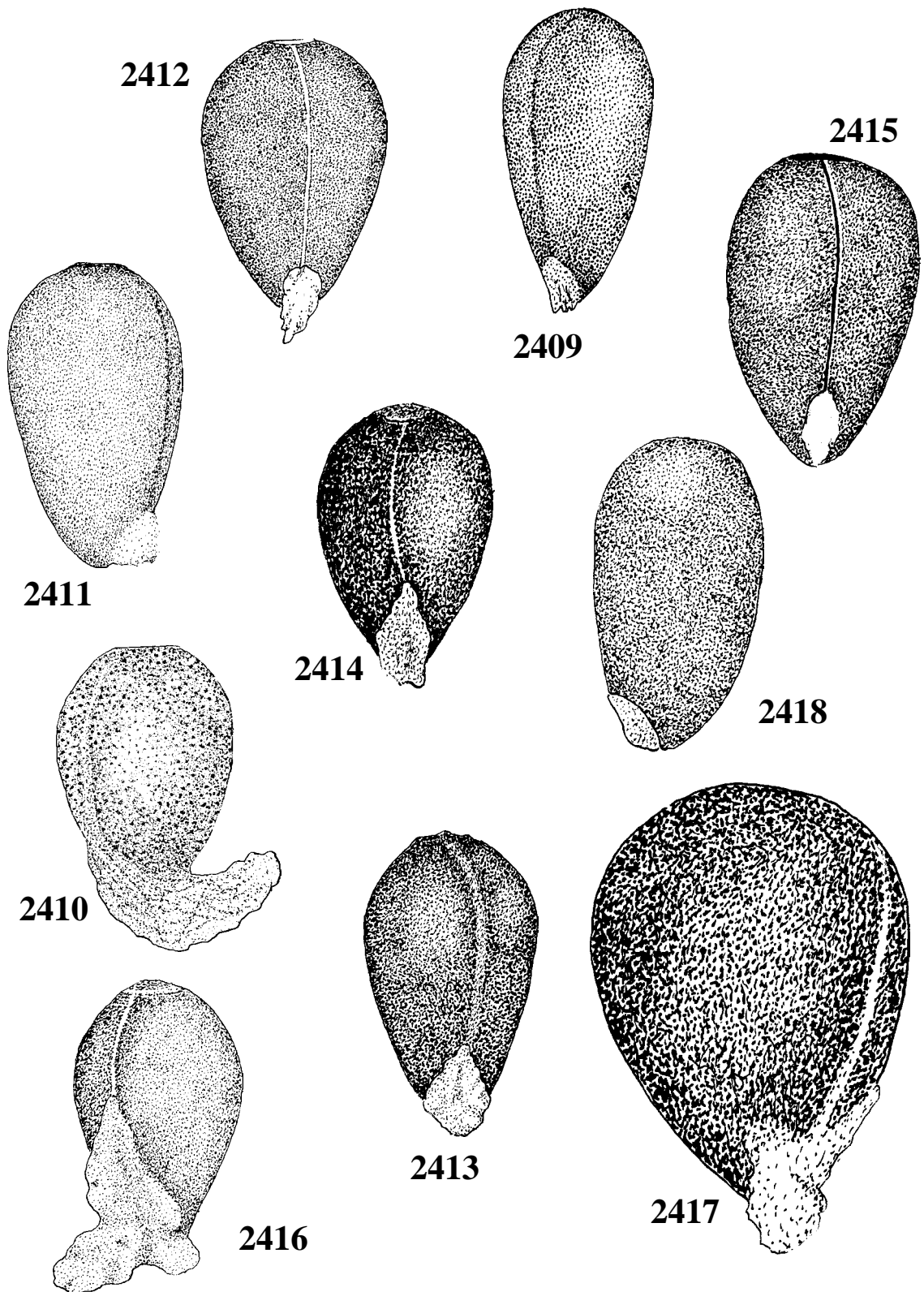
**2414. *Viola epipsila* Ledeb., *V. suecica* Fr.** — Perennial, very similar to *V. palustris*, always with two cordiform up to reniform leaves, flower pale-violet. **Seeds obovate, aril subbasal, covering 1/6-1/4 of the raphe, 1.7-2 x 1.1-1.3 mm. Surface glossy, distinct areolate, often pustular, olive- to dark-brown, spots dark-brown. 2n = 40.** Native to Eurasia, in moist meadows, muddy places, shrubberies, peatbogs. Br, Pl, Ro, Sk, Uk.

**2415. *Viola gracilis* Sibth. et Sm.** — Perennial, puberulent, up to 30 cm high, leaves orbicular-ovate or oblong, obscurely crenate, flowers violet or yellow. **Seeds obovoid, with longitudinal suture on ventral side, with whitish elaisome at the bottom, 1.5-1.8 x 0.9-1.1 mm. Surface smooth, lustrous, pale reddish-brown. 2n = 20.** Native to the Balkan Peninsula, on rocks and alpine meadows; in the Carpathians rarely cultivated in rock-gardens.

**2416. *Viola hirta* L., *V. hirsuta* Roem. et Schult.** — Perennial, a tuft-forming plant, with hairy radical leaves and bluish-purple, scentless flowers. **Seeds ovoid, with a large aril, extending upwards and covering c. 2/3 of the raphe, 2.2-2.4 x 1.4-1.6 mm. Surface areolate, lustrous, whitish or lightish-brown with small dark-brown spots. 2n = 20.** Native to Eurasia, on dryer pastures, grassy and stony slopes, light forest edges; throughout the Carpathians.

**2417. *Viola joói* Janka, *V. ambigua* Salzer, *V. transsilvanica* Schur** — Perennial, plant up to 10-27 cm high, rhizome large, simple or branched, leaves reniform-cordate in a basal rosette. **Seeds broad obovoid, with caruncle at the bottom, extending upwards and covering c. 1/3 of the raphe, 2.2-2.4 x 1.4-1.6 mm. Surface waved, lustrous, reddish. 2n = 24.** Native (endemic) to Romania, in calcareous rocky and scree stands, of montane and subalpine zones. Ro, Uk

**2418. *Viola kitaibeliana* Schult., *V. parviflora* Kit.** — Annual, a dense, short undulate downy plant, stems  $\pm$  erect, unbranched, 5-20 cm high, flower yellow-white to yellow. **Seeds obovate, caruncle 1/5-1/4 of the raphe, 1.3-1.4 x c. 0.7 mm. Surface glossy, distinct**



**areolate, pale-brown.  $2n = 16$  (24, 36).** Native to European sunny stony slopes, fallows, vineyards, on stony, sandy, dry and shallow soils. Au, Hu, Mo, Pl, Ro, Sk, Uk.

**2419. *Viola lutea* Huds. subsp. *sudetica* (Willd.) Nyman, *V. sudetica* Willd.** — Perennial, stems up to  $\pm 15$  cm high, erect, leaves bare or downy, flowers light-yellow, spur bluish. **Seeds obovoid, on ventral side with longitudinal rib and elaisome below, apex truncate,  $1.9-2.1 \times 1.1-1.3$  mm. Surface smooth, slight lustrous, yellowish-brown.  $2n = 48$ .** Native to the West Carpathians, at mountain grassy and stony ridges, in moist, basic and ventral soils. Cz, Pl, Sk.

**2420. *Viola mirabilis* L.** — Perennial, up to 20 cm high, a spring plants with leaves in a rosette, flower peduncle 5-12 cm, flower pale-violet, scented. **Seeds prolonged obovoid, aril basal, covering  $1/5-1/3$  of the seed length,  $2.7-2.9 \times 1.4-1.6$  mm. Surface lustrous, indistinct areolate, orange-brown.  $2n = 20$ .** Native to Eurasia, in light humous woodlands, on moist, in summer drying soils; throughout the Carpathians.

**2421. *Viola montana* L., *V. canina* subsp. *montana* Hartm.** — Perennial, stems single or few,  $\pm$  erect, 10-30 cm high, glabrous or scattered pubescent. **Seeds oblong, aril c.  $1/5-1/4$  of the raphe,  $1.8-2.1 \times 1.1-1.3$  mm. Surface lustrous, longitudinal foveolate or striate, medium- to dark-brown.  $2n = 40$ .** Native to Europe, in forests, shrubberies, meadows and other grassy places. Hu, Ro, Uk.

**2422. *Viola odorata* L., *V. lilacina* Rossm.** — Perennial, a plant with stolons, peduncle arises directly from the basal rosette of leaves. **Seeds obovate, aril conspicuous, basal, extending upwards and covering  $1/2-3/4$  of the raphe, in dorsal view strong protruding, free part of the aril at least  $1/3$  of the seed length,  $2.4-2.6 \times 1.7-1.9$  mm. Surface lustrous, distinct areolate, uniform coloured, whitish-yellow.  $2n = 20$ .** Native to Europe, in humous forests and shrubberies, shady grassy places; throughout the Carpathians.

**2423. *Viola palustris* L.** — Perennial, without stems, rhizome thin, shooty, leaves in a ground rosette, flower and spur pale-violet. **Seeds obovoid, aril very small, covering  $1/8-1/6$  of the seed length,  $1.4-1.7 \times 0.9-1.1$  mm. Surface lustrous, faint and prolonged linear, blackish to black.  $2n = 48$ .** Native to Europe,

in bogs and marshes, muddy meadows, reed beds with wet and rather peaty soils; in all Carpathian territories.

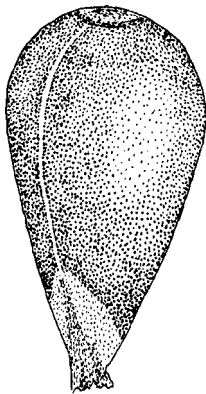
**2424. *Viola pumila* Chaix, *V. pratensis* Mert. et W. D. J. Koch** — Perennial, glabrous plant without ground leaf rosette, stems ascendent to erect, 5-20 cm, flower vivid blue-violet. **Seeds obovoid, aril covering c.  $1/4$  of the raphe,  $1.9-2.2 \times 1.1-1.3$  mm. Surface lustrous, fine areolate, dark-brown.  $2n = 40$ .** Native to Eurasia, in damp meadows and pastures, fanlands of lowland and submontane zones. Hu, Mo, Pl, Ro, Sk, Uk.

**2425. *Viola reichenbachiana* Jord. ex Boreau, *V. sylvestris* Lam. p.p.** — Perennial, stems ascendent from the middle of rosette and armpit of the leaves flowers light-violet scentless, spur violet. **Seeds obovoid, aril basal, covering c.  $1/8$  of the seed length, 5-6 mm long,  $2.2-2.4 \times 1.4-1.6$  mm. Surface indistinct areolate, lustrous, orange-brown.  $2n = 20$ .** Native to Europe, in woods, scrubs and shady places; in all Carpathian territories.

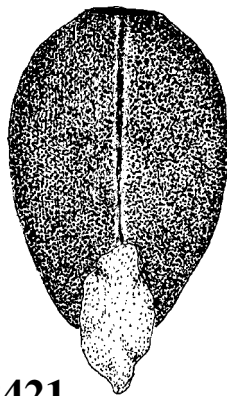
**2426. *Viola riviniana* Rchb.** — Perennial, stems  $\pm$  erect, 5-20 cm high, with both radial leaf rosettes and ascending, leafy, flowering stems, flower blue-violet, scentless, spur whitish, 3-4 m long. **Seeds obovoid,  $1.9-2.1 \times 1.3-1.5$  mm. Surface lustrous, distinct areolate, brown.  $2n = 40$ .** Native to Europe, in shady woodlands and grasslands, from lowland to montane zones cultivated as an ornamental in parks, in shady places. Hu, Mo, Pl, Ro, Sk, Uk.

**2427. *Viola rupestris* F. W. Schmidt, *V. arenaria* DC.** — Perennial, rhizome short, maniheads, stem ascending from the rosette, up to 10 cm high. **Seeds obovate, aril basal, covering c.  $1/4$  of the seed length,  $1.5-1.8 \times 0.8-1$  mm. Surface glossy, fine areolate, pale- to dark-brown.  $2n = 20$ .** Native to Eurasia, on sunny and rocky slopes in open habitats with light base-rich soils; in all Carpathian territories.

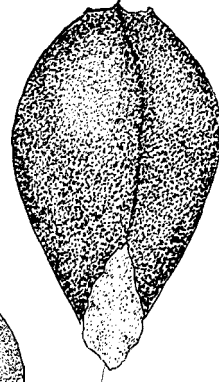
**2428. *Viola stagnina* Kit. ex Schult., *V. persicifolia* auct. non Scherb.** — Perennial, stems from base decumbent, ascendent up to erect, pubescent, 10-30 cm high, ramified. **Seeds obovate, aril very small, only at the margin of the hilum,  $1.3-1.5 \times 0.8-1$  mm. Surface lustrous, distinct areolate, dark-brown.  $2n = 20$ .** Native to Eurasia, on marshes and fens, moist meadows, embankments, riverbanks; in all Carpathian territories.



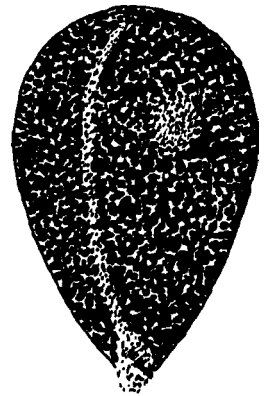
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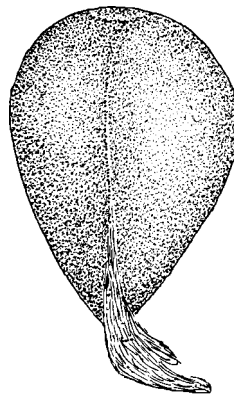
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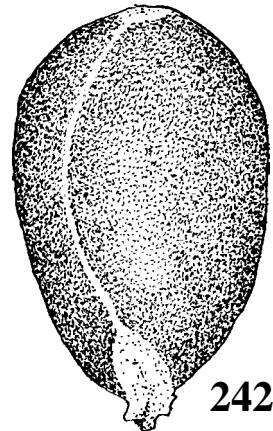
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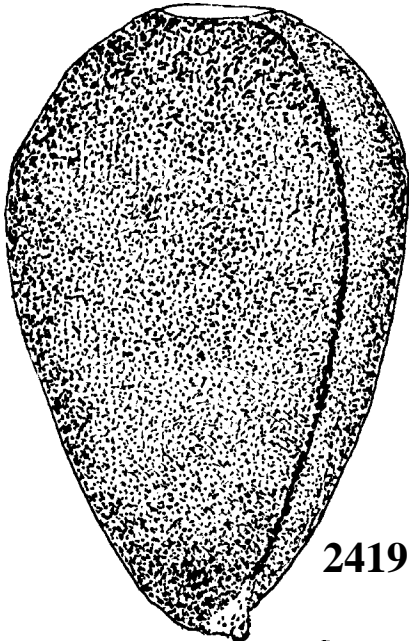
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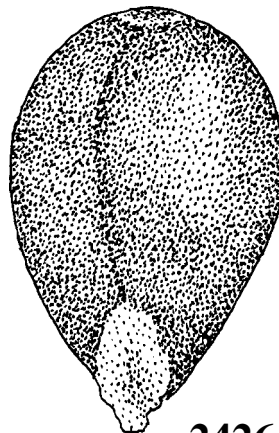
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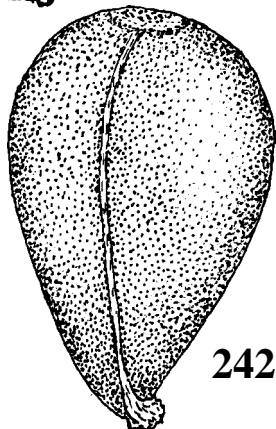
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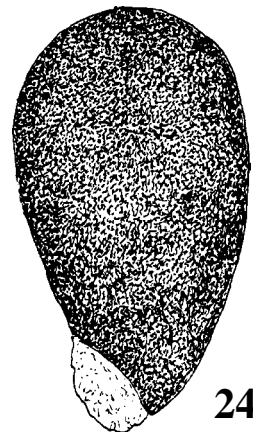
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**2429. *Viola suavis*** M. Bieb., *V. sepincola* Jordan, *V. pontica* W. Becker — Perennial, rhizome short, stems 6-20 cm long, stolons c. 10 cm. **Seeds obovoid with a small aril, extending upwards and covering c. 1/4 of the raphe, free part of the aril at least 1/3 of the seed length, usually longer, 2.6-2.8 x 1.8-2 mm. Surface lustrous, fine areolate, uniform whitish-yellow. 2n = 40.** Native to eastern Europe, in high shrubberies and forest edges, forest steppes, on humous, wet soils; throughout the Carpathians.

**2430. *Viola tricolor*** L. em. F. W. Schmidt — Annual up to perennial, bare or shortly downy plant, stems erect or ascendent, 15-30 cm, ramified. **Seeds prolonged obovoid, aril 1/5-1/3 of the raphe, 1.4-1.7 x 0.7-0.9 mm. Surface lustrous, fine areolate, medium-brown. 2n = 26.** Native to Europe, common on poor sandy fields and dunes, meadows, boundaries, pastures, unimproved large-flowered forms are grown in gardens; throughout the Carpathians.

**2431. *Viola uliginosa*** Besser — Perennial, rhizome creeping, without stem, with rosettes of cordiform leaves, flower blue-violet, spur violet, 3-4 mm. **Seeds obovate, aril basal, thick and rounded, covering 1/5-1/3 of the raphe, free part of the aril less than 1/4 of the seed length, 2.1-2.3 x 1.3-1.5 mm. Surface dull to lustrous, faint areolate, pits irregular, sometimes elongated, medium-orange. 2n = 20.** Native to Europe, seldom in the East Carpathians, in swampy meadows and lowland forests. Pl, Ro (?), Uk.

**2432. *Viola x witrockiana*** Grams, *V. hortensis* auct., *V. maxima* hort., *V. altaica* Ker. - Gawl. — Biennial up to perennial, stems ascendent, ramified, 10-30 cm high. **Seeds obovate, apex 1/6-1/5 of the raphe, 2-2.3 x 1.1-1.3 mm. Surface glabrous, fine waved, reddish-brown. 2n = 48-50.** Garden hybrid (*V. lutea* x *tricolor*); commonly cultivated in gardens, parks, often escaping into waste places, grassy sites and dumps.

# 115. PASSIFLORACEAE

**2433. *Passiflora caerulea*** L. — Woody plant, twining, with tendrils, shoots up to 6 m. **Seeds ovoid to ellipsoid, apex narrowed to apiculate, base truncate with a caruncle, 4.2-4.6 x 2.7-2.9 mm. Surface foveolate or roughly and deeply pitted, the pits often filled with dry pulp, blackish-brown, often with whitish pitcentrum.** Originally introduced into Europe; often from Brazil and Peru, cultivated

in dwellings as an ornamental, in many cvs and hybrids.

**2434. *Passiflora incarnata*** L. — Species similar to *P. caerulea*, which differing in trilobate leaves, fragrant flowers with red coronas and bulky fruits as large as apples. **Seeds obovoid, with 5-6 rooflike ridges, apex with a small beak, base with indistinct hilum, 3-3.3 x 1.7-1.9 mm. Surface lustrous, blackish-brown.** Native to Brazil; in the Carpathians very rarely cultivated in domiciles, mostly in botanical gardens.

# 116. BEGONIACEAE

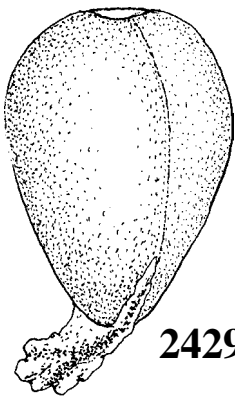
**2435. *Begonia evansiana*** Andr., *B. bulbifera* hort. — Plant up to 60 cm high, glabrous, reddish, flexible. **Seeds ovoid to elliptic, slight flattish, 0.4-0.5 x 0.2-0.25 mm. Surface distinct reticulate to areolate, dull, smooth, orange-brown.** Native to Brazil; a decorative plant cultivated in dwellings, reproduced mostly by bulbs.

**2436. *Begonia maculata*** Raddi, *B. argyrostigma* Fisch — Perennial, frutescent plant, 50-90 cm high, glabrous, leaves oval-lanceolate, cordate. **Seeds ± cylindric with rounded corner or elliptic, apex and bottom rounded, 0.4-0.5 x 0.2-0.25 mm. Surface reticulate, lustreless, brown.** Native to Brazil; in the Carpathians rarely cultivated in gardens for its nice coloured flowers, in many cvs.

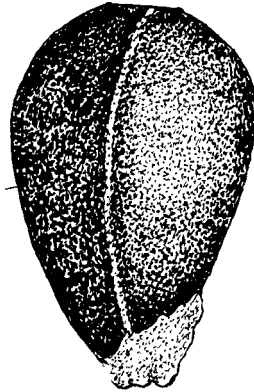
**2437. *Begonia rex*** Putzeys — Perennial, grassy plant, stems very short or stemless, 15-30 cm high, leaves oval, cordate, asymmetric. **Seeds ± club-shaped, lateral compressed, dorsal side roundish, ventral narrowed, proper seed corpus in bottom part, 0.3-0.35 x 0.15-0.2 mm. Surface reticulate, lustreless, pale-brown.** Native to oriental India; in the Carpathians often cultivated in dwellings as a flower-pot ornamental plant, in many cvs.

**2438. *Begonia semperflorens*** Link et Otto, *B. hookeri* Sweet — Perennial, plant 30-50 cm high, pulpy, green- or copper-coloured. **Seeds obovoid to elliptic, slight flattish, apex broader and rounded, base slight narrowed, 0.35-0.45 x 0.25-0.3 mm. Surface distinct areolate, dull, reddish-brown.** Originally in Brazil; introduced into Europe and cultivated as perennial ornamental plant in interiors, balconies.

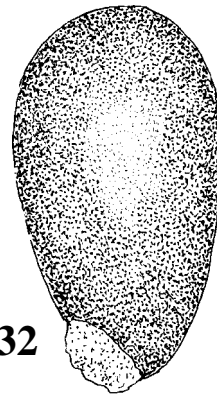




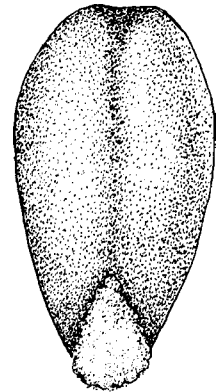
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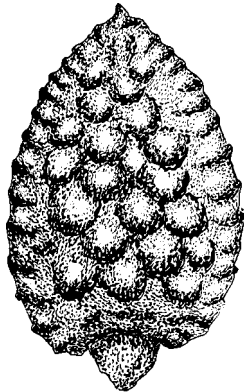
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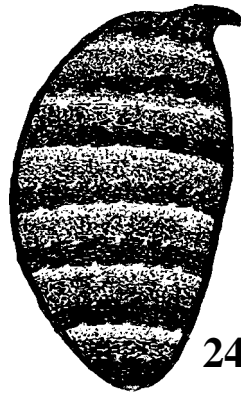
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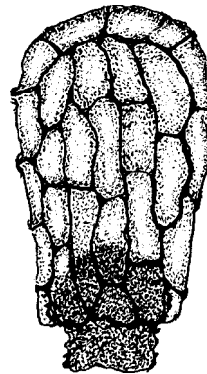
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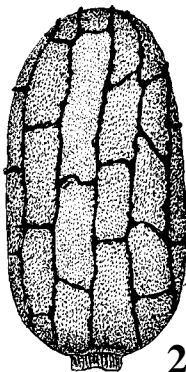
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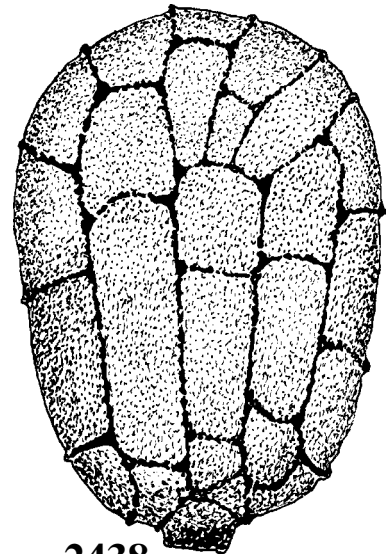
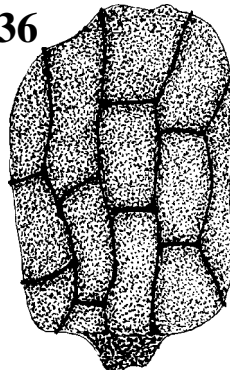


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**2439. *Begonia x tuberhybrida*** Voss — Perennial, stems 50-80 cm high, of hybrid origin (*B. boliviensis* x *davidsii*, *B. froebelii* x *weitchii*), often with full-blossom flowers. **Seeds very small, oval, 0.5-0.6 x 0.2-0.3 mm. Surface irregular reticulate, faint lustrous, reddish-brown.** Native to South America; in the Carpathians often cultivated in flowerpots in many cvs.

## 117. CUCURBITACEAE

**2440. *Bryonia alba*** L., *B. aspera* Schur — Perennial, mono- or dioecious, with climbing branches from a fleshy tuberous root, up to 4 m long. **Seeds broad obovoid, flattish, transverse section elliptic, edge with a conspicuous ridge, base truncate, arillate, 3.6-4 x 2.7-3 mm. Surface roughen with irregular ridges and knobs, dark-greyish to black. 2n = 20.** Native to southeastern Europe and Asia, in shrub-beries, fences, coastal scrubs; formerly cultivated as a medicinal plant; throughout the Carpathians.

**2441. *Bryonia dioica*** Jacq., *B. cretica* L. — Perennial, stems climbing by means of unbranched tendrils, up to 4 m long, leaf lobes entire or with few, large, subobtuse teeth, fruit 6-10 mm in diam., red. **Seeds obovoid, lateral slight flattish, arillate on lateral side, 3.8-4.2 x 3.2-3.4 mm. Surface smooth, lustreless, light-brown, dense blackish-spotted.** Native to Eurasia, in coastal scrubs, forests, waste lands; in the Carpathians formerly cultivated as a medicinal plant and often naturalized.

**2442. *Thladiantha dubia*** Bunge — Perennial, up to 150 cm high, stems with simple tendrils, climbing. **Seeds obovoid, prolonged ellipsoid, flattish, edge without or with a narrow ridge, 4.5-4.8 x 3.1-3.3 mm. Surface dense fine pitted, dull, grey or black. 2n = 18.** Originally growing in China; in the Carpathians cultivated in parks and gardens for covering walls, locally naturalized. Br, Hu, Mo, Ro, Sk, Uk.

**2443. *Ecballium elaterium*** (L.) A. Rich., *Elaterium cordifolium* Moench — Perennial, bristly hirsute plant, stems procumbent, 30-100 cm long, without tendrils. **Seeds broad obovoid, margin with narrow ridge, 4.3-4.8 x 2.9-3.1 mm. Surface dense minute pitted, dull, greyish, pale- to dark-brown. 2n = 24.** Native to southern Europe; in the Carpathians seldom spontaneous in littoral stands, planted in gardens, impermanently escaping. Hu, Mo, Ro, Sk, Uk.

**2444. *Citrullus lanatus*** (Thunb.) Matsum, *C. vulgaris* Schrad., *C. edulis* Pang., *Colocynthis citrullus* (L.) O. Kuntze — Annual, procumbent plant, stems with tendrils, long pilose, up to 3 m long. **Seeds obovoid, flattish, apex obtuse, base truncate, margin with narrow ridge, 6-9 x 4-6 mm. Surface roughen, dull, glabrous, dark marbled, black or dark-brown. 2n = 22, 44.** Native to southern Africa; in the Carpathians widely cultivated in gardens and fields on sandy soils as a fruit crop. Hu, Mo, Ro, Sk, Uk.

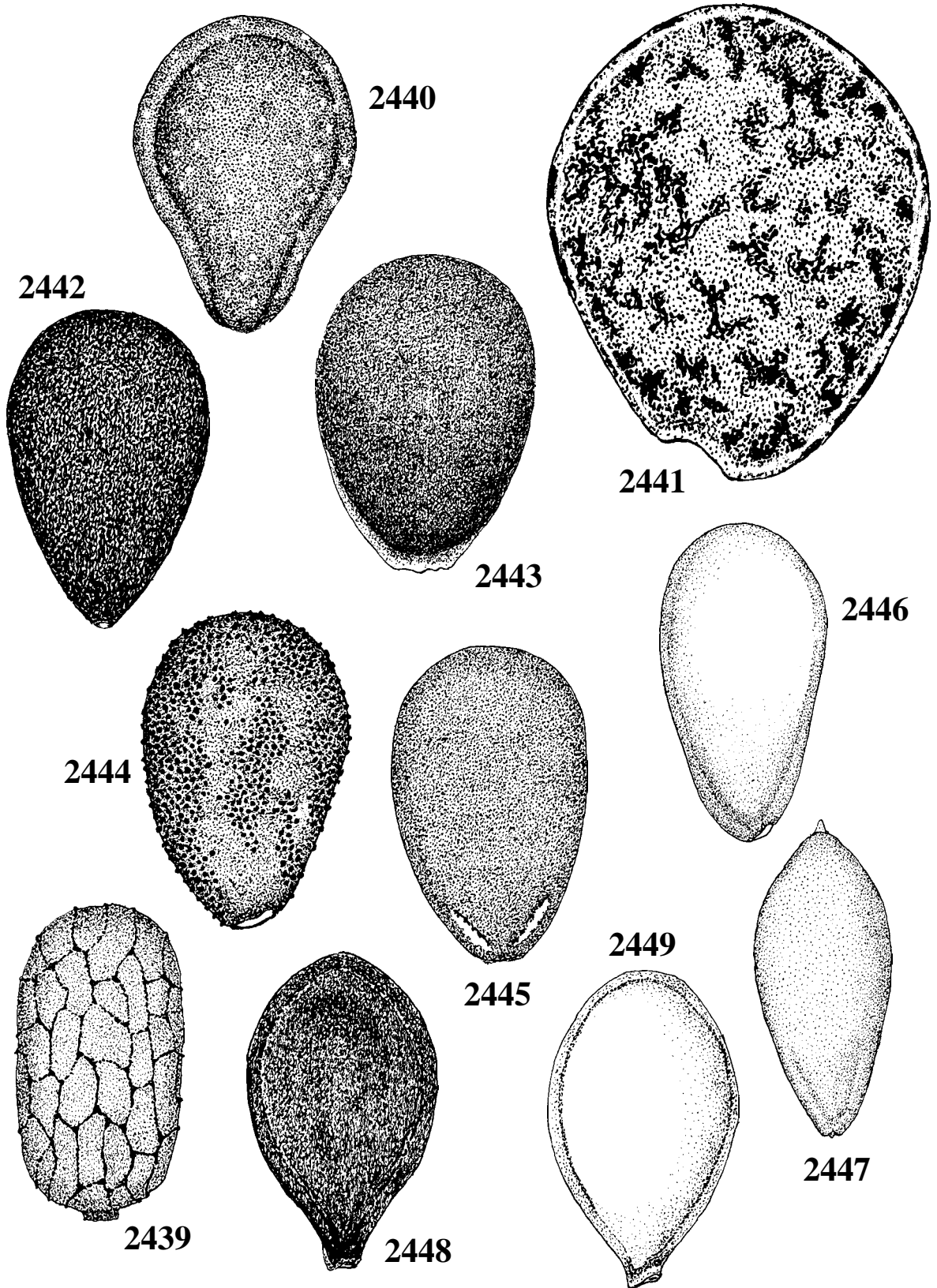
**2445. *Colocynthis vulgaris*** Schrad., *Citrullus colocynthis* (L.) Schrad. — Perennial, prostrate, very scabrid herb with long trailing branches. **Seeds oblong-obovate, compressed, base with short furrows on both sides, 6-10 x 3.6-5 mm. Surface slight lustrous, dense pitted, dirty-yellow, brown or greyish. 2n = 22.** Native to Africa and Asia, in deserts and on sandy banks; in the past cultivated as a medicinal plant for its purgative fruits, often naturalized. Hu, Mo, Ro, Uk.

**2446. *Melo sativus*** Sar., *Cucumis melo* L. — Annual, prostrate, hispidulous plant with long trailing branches up to 2 m long. **Seeds prolonged obovoid, strong flattish, narrowed at base, margin slight arillate, 8-11 x 4-5 mm. Surface smooth, dull, whitish-yellow. 2n = 24, 48.** Originally growing in tropical Africa and Asia; cultivated in warmer areas for its edible fruit (Melon).

**2447. *Cucumis sativus*** L. — Annual, stout, prostrate, hispidulous herb up to 1 m long. **Seeds prolonged obovoid, apex and base narrowed, with a small acute membranous beak at the apex and a short hem at the base, 9-11 x 3.5-5 mm. Surface smooth, dull, dirty greyish-white. 2n = 14, 28.** Originally growing in India; a long time ago cultivated in gardens and fields for its edible fruits (Cucumber).

**2448. *Cucurbita ficifolia*** Bouché, *C. melanosperma* A. Br. — Perennial, stems decumbent, ramified, leaves reniform, fruits ovate, 20-30 cm long. **Seeds strong flattish, ellipsoid with a aril along the whole perimeter, 15-20 x 10-13 mm. Surface faint waved, slight lustrous, blackish.** Originally growing in eastern Asia and Central America, often cultivated for culinary purposes, in lowland sandy areas. Hu, Ro.

**2449. *Cucurbita maxima*** Duchesne — Prostrate herb similar to *C. pepo* with larger fruits. **Seeds obovoid, flattish, apex rounded, base narrowed, closed with**



truncate part with hilum, 18-25 x 11-15 mm. Surface smooth, dull, glabrous, whitish.  $2n = 40$ . Originally growing in tropical America; cultivated as a vegetable (Pumpkin) in southern and central Europe in many cvs.

**2450. *Cucurbita moschata*** Duch. — Annual, prostrate plant with long stems. **Seeds obovoid, flattish, apex rounded, base constricted, truncate with convex hilum, 13-20 x 7.5-9 mm. Surface smooth, dull, margin arillate, brown, seldom white or reddish-yellow.  $2n = 40$ .** Originally growing in tropical America; cultivated in warmer climate as a vegetable and fodder, in gardens and fields in many cultivars. Hu, Mo, Pl, Ro, Uk.

**2451. *Cucurbita pepo*** L. — Annual, stems prostrate or trailing (with ramified tendrils), up to 10 m long, angular, bristly. **Seeds obovoid with a distinct aril, flattish, apex obtuse, base narrowed, truncate, 20-25 x 10-13 mm. Surface smooth, dull, yellowish-white.  $2n = 40-80$ .** Originally growing in tropical America; widely cultivated in gardens for its edible and ornamental fruits (Gourd), and in fields as fodder for animals, in both cases in many subsp., convar. and cvs.

**2452. *Echinocystis lobata*** (Michx. fil.) Torr. et A. Grey, *E. echinata* (Mühlenb. ex Willd.) Britt. et al. — Annual, nearly glabrous, stems with ramified tendrils, up to 8 m long. **Seeds ellipsoid, apex rounded, base constricted and truncate, 17-18 x 9-10.5 mm. Surface wrinkly, dull, medium- to dark-brown.  $2n = 32$ .** Originally growing in North America; dragging into Europe and naturalized from gardens. Hu, Mo, Ro, Sk, Uk.

**2453. *Sicyos angulata*** L. — Annual, viscid-pubescent plant, stems with ramified tendrils, twinning, 2-8 m long. **Fruits amphisarcum (in front), slight ellipsoid, lateral compressed, apex apiculate, base obtuse, 10-12 x 6-7 mm. Surface roughen, medium- to dark-brown. Seed (behind) ellipsoid, with pale boss at the apex. Surface smooth, dull, greyish-black.  $2n = 24$ .** Originally growing in North America; occasionally dragging and naturalized in waste moist places and coastal shrubs. Hu, Mo, Pl, Ro, Sk, Uk.

**2454. *Luffa acutangula*** (L.) Roxb., *Cucumis acutangula* L. — Annual, stems up to 2 m long, procumbent, leaves, 10-15 cm long. **Fruits 10-60 cm long. Seeds oblong-obovoid, lateral strong compressed, apex rounded, bottom narrowed, 11-13 x 7-8 mm.**

Surface lustreless, blackish with black spots. Native to tropical Asia; in the Carpathians rarely cultivated in the southern warmer areas, fruits utilized in manufacture of sponges. Mo, Uk.

**2455. *Luffa cylindrica*** (L.) Roem., *Momordica cylindrica* L., *M. luffa* L. — Annual, monoecious, procumbent, up to 3-6 m long, fruit cylindric, up to 50 cm long, green, smooth. **Seeds strong flattish ellipsoid with a smooth or undulate aril along the whole perimeter, 10-13 x 7-8 mm. Surface ruminate, lustrous, whitish-yellow or black.** Originally growing in eastern India, until recently sporadically cultivated for technical purposes and also as an ornamental plant. Mo, Ro, Uk.

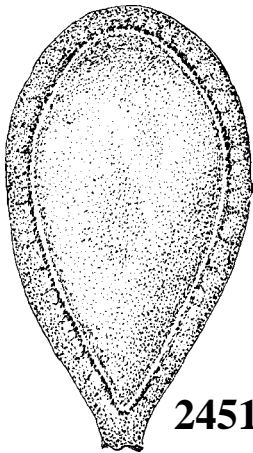
**2456. *Lagenaria siceraria*** (Molina) Standl. — Annual, up to 2 m high, trailing, with two different tendrils and with hairy stems. **Seeds oblong, obovoid, apex truncate, bottom narrowed, obtuse, with two longitudinal furrows united at the bottom, hilum at one side of the bottom, 14-16 x 6-7 mm. Surface glabrous, white or brown.** Native to southern Asia and southern Africa, in gardens and fields. Mo, Uk.

**2457. *Lagenaria vulgaris*** Röem. — Annual, stems up to 2 m long, robust, markedly hirsute, fruits up to 1 m long. **Seeds strong flattish, cylindric, apex truncate, bottom acuminate, margins arillate, 15-20 x 9-11 mm. Surface slight tuberculate, lustreless, whitish-yellow or brown.** Originally growing in tropical Africa and eastern India; in the Carpathians for a long time cultivated to and for as an ornamental and fruit-bearing interesting plant. Hu, Ro, Uk.

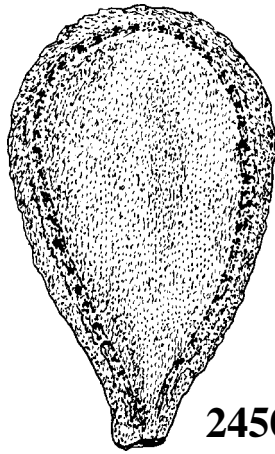
## 118. PRIMULACEAE

**2458. *Primula auricula*** L. — Perennial, rhizome short, rough, leaves forming a basal rosette, flowers yellow, flower stalks 5-15 cm long. **Seeds multisided prism with distinct angles, 1-1.5 x 0.8-1.2 mm. Surface of the angles covered with pale hyaline warts, dull, dark-brown.  $2n = 62$ .** Endemic to the Carpathians in subsp. *hungarica*, on rock-crevices or wet alpine grasslands. Hu, Pl, Ro, Sk.

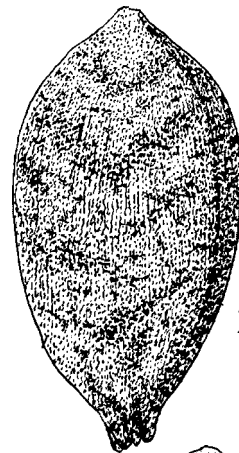
**2459. *Primula columnae*** Ten., *P. suaveolens* Bertol. — Perennial, stems up to 25 cm, leaves hard, ovoid or oblong-ovoid, cordate or rounded at base, flowers yellowish-golden. **Seeds blunt angular, horizontal compressed, dorsal side convex, ventral rooflike, with oblong hilum, 1.4-1.6 x 0.6-0.8 mm.**



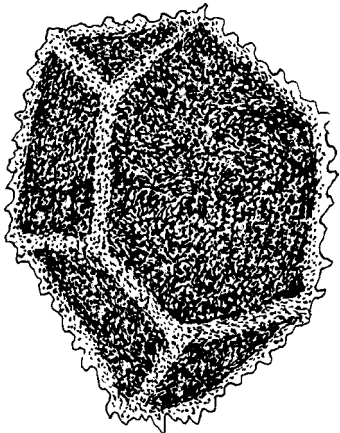
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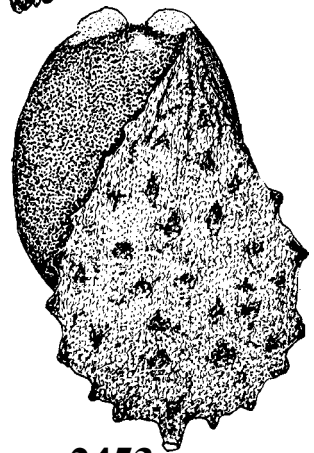
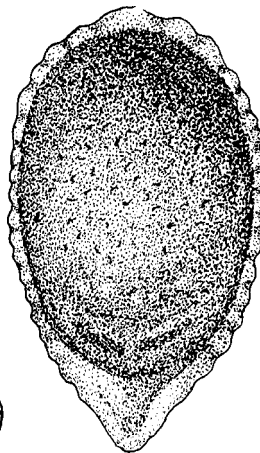


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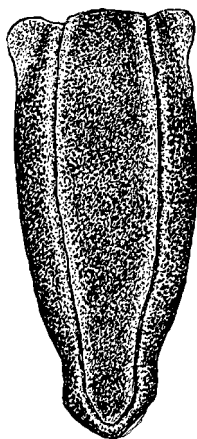


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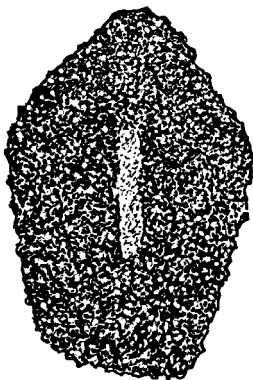
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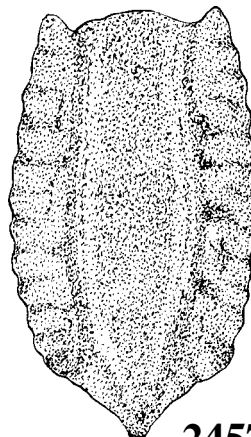
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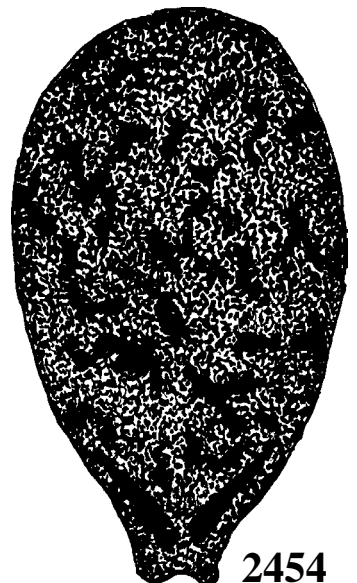
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**Surface dull, dark-brown, whitish tuberculate.** Native to southern Europe and Asia Minor, in shrubby, dry, leafy woods. Ro.

**2460. *Primula denticulata*** J. M. Sm. — Perennial, stems 15-20 cm high, basal leaves in a rosette, spherical inflorescence on a strong stalk. **Seeds angular, dentate at edges, 0.8-0.9 x 0.6-0.7 mm. Surface waved, slight lustrous, dark-brown.** Native to the Himalayas; in the Carpathians often cultivated in hybrid forms, mostly with *P. cashmiriana* Hook., in white, rose and violet colours, as a very attractive ornamental.

**2461. *Primula elatior*** (L.) L. — Perennial, rhizome short, basal leaves forming a rosette, flower stalks 10-30 cm long. **Seeds multiangular, mostly trapeziform, oval up to globular, without caruncle, 1.2-1.8 x 1-1.4 mm. Surface covered with hyaline warts, dull, dark-brown. 2n = 22.** Native to Europe, on wet meadows, marshy mountain, mixed and deciduous woodlands, at altitudes up to 1500 m; throughout the Carpathians.

**2462. *Primula farinosa*** L. — Perennial, basal leaves forming a rosette, farinose or efarinose, rhizome short, flower stalk 5-15 cm long, flowers pink-violet, heterostylous. **Seeds mostly prismatic or irregular, multiangular, without caruncle, often winged, 0.6-0.8 x 0.4-0.6 mm. Surface verrucose, dull, lustrous, non-viscid, pale- to dark-brown. 2n = 18.** Native to Europe, on marshes and damp meadows, stony, humous, usually base-rich soils; throughout the Carpathians.

**2463. *Primula halleri*** J. F. Gmel., *P. longiflora* All. — Perennial, leaves in a basal rosette, farinose, flowers light-violet, homostylous, flower-stalk 5-10 mm long. **Seeds mostly of prismatic shape, flat-tish, 0.5-0.8 x 0.4-0.6 mm. Surface with hyaline warts, dull, pale- to dark-brown. 2n = 22 (36).** Endemic to the High Tatras in subsp. *platyphylla* O. Schwarz, on mountain moist meadows with calcareous soils. Pl, Ro, Sk, Uk.

**2464. *Primula leucophylla*** Pax, *P. elatior* subsp. *leucophylla* (Pax) H. Harrison ex Sm. — Perennial, plant up to 10-30 cm high. **Seeds irregular multi-sided prism with distinct angles, 1.5-1.9 x 1.1-1.4 mm. Surface at angles with scattered areas of hyaline warts, dull, dark-brown.** Native to mountains of the East Carpathians with calcareous substrates, at shrubby edges, calcicole. Ro.

**2465. *Primula malacoides*** Franch. — Annual, stems with white hairs in the lower part, glabrous above. **Seeds mostly multilateral, rhomboidal, dorsal side convex, single areas of ventral side flat, with oval whitish hilum in the middle, 0.7-0.9 x 0.5-0.6 mm. Surface granular, lustreless, dark-brown.** Originally growing in China; commonly cultivated in dwellings or greenhouses as an ornamental.

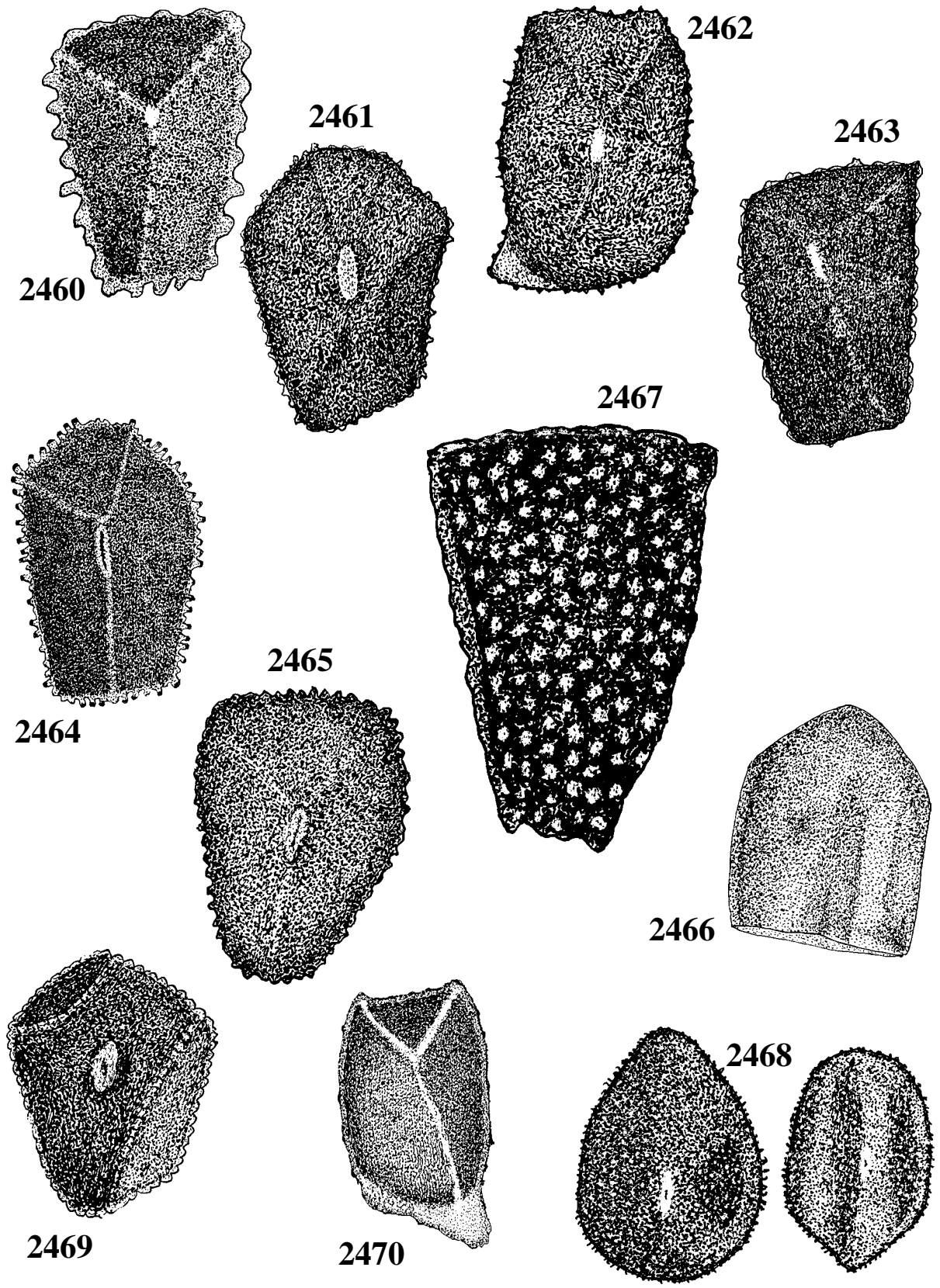
**2466. *Primula minima*** L. — Perennial, a carpetly wide-spreading stand, 2-4 cm high, leaves in a dense basal rosette, flower stalks 2-3 mm long. **Seeds of irregular shape, mostly angular, trapeziform, triangular, without caruncle, 0.6-1 x 0.6-0.8 mm. Surface non-viscid, smooth, medium-brown. 2n = 66.** Native to mountains of central and southern Europe, on alpine pastures, snow patches, damp rocks, a calcifuge, on granite minerals. Pl, Ro, Sk, Uk.

**2467. *Primula rosea*** Royle — Perennial, stems 8-12 cm high. **Seeds angular or pyramidal, apex and bottom truncate or acuminate, 1.1-1.3 x 0.8-0.9 mm. Surface reticulate, slight lustrous, brown.** Native to the Himalayas, in moist stands; in the Carpathians rarely cultivated in gardens and rock-gardens as an ornamental.

**2468. *Primula veris*** L., *P. officinalis* (L.) Hill. — Perennial, rhizome short, leaves forming a basal rosette, flower stalks 10-30 cm long. **Seeds shield-shaped, irregular in shape and size, multiangular, without caruncle, with prolonged pale-brown hilum on ventral side, 1.2-1.8 x 0.9-1.4 mm. Surface verrucose, dull, lustreless, dark-brown to black, margin serrate. 2n = 22.** Native to Europe, in light deciduous forests and shrubberies, dryer meadows to warmer areas; in all Carpathian territories.

**2469. *Primula vulgaris*** Huds., *P. acaulis* (L.) L., *P. veris* var. *acaulis* L. — Perennial, without a stem, rhizome short, more-headed, leaves in a basal rosette. **Seeds irregular in shape and size, margin indistinct serrate, with caruncle, 1.5-2 x 1-1.5 mm. Surface verrucose, viscid, dull, lustreless, dark-brown. 2n = 22.** Native to Eurasia, common in woods and hedges, rocks and stony slopes, calcicole. In gardens cultivated in hybrid form (*P. acaulis* x *juliae*) from the Caucasus. Hu, Pl, Ro, Sk, Uk.

**2470. *Primula wulfeniana*** Scott, *P. baumgarteniana* Degen et Moesz, *P. integrifolia* Baumg. — Perennial,



glabrous, stems only 5-7 cm high, flowers of lilac colour. **Seeds rectangular, lateral compressed, apex truncate, bottom  $\pm$  rounded, margins sharp, with hilum spur, 1.4-1.6 x 0.9-1.1 mm. Surface slight lustrous, dark-brown, margin pale.**  $2n = 22$ . Endemic to the meridional Carpathians, on stony calcareous stands of the alpine zone. Ro.

**2471. *Primula x pubescent* Jacq.** — Perennial, stems 25-35 cm high, leaves bare, stiff, leathery, flowered in many colour shades, from gold-yellow to reddish-violet up to nearly black. **Seeds many angular, compressed, 1.3-1.5 x 1-1.2 mm. Surface fine whitish verrucous or pubescent, dark-brown.** One of the old hybrids (*R. auricula x viscosa*), often cultivated in gardens as an ornamental.

**2472. *Androsace carnea* L.** — Perennial, laxly caespitose; leaves 5-30 x 1-2 mm, linear, sometimes fleshy and keeled, pubescent or glabrous, ciliate. **Seeds ellipsoid or oblong-obovate, dorsal side slight convex, ventral slight rooflike or flat, 3.5-4 x 1.8-2.1 mm. Surface wrinkly, faint lustrous, dark-purplish.**  $2n = 38$ . Native to mountains of western Europe, on rocks and screes, a calcifuge; in the Carpathians cultivated as an ornamental in gardens.

**2473. *Androsace chamaejasme* Wulf.** — Perennial, scarcely tufted, rhizome branched, many-headed, flower stalks 1-7 mm long. **Seeds irregular shaped with indistinct angles, mostly oval, narrowed to both ends, 1.8-2.2 x 1.3-1.5 mm. Surface ruminant, slight lustrous, reddish-brown.**  $2n = 20$ . Native to mountains of Europe, on calcareous rocks and screes, stony and loamy soils. Pl, Ro, Sk.

**2474. *Androsace elongata* L.** — Annual, shortly downy, leaves form a rosette, flower stalks (1-4) thin, sparsely hirsute, 2-8 cm high. **Seeds multiangular, pyramidal, obovate with serrate angles, 1-1.3 x 0.7-0.9 mm. Surface reticulate, suture indistinct, dull, dark-brown.**  $2n = 40$ . Native to Europe, in dry open habitats, sunny slopes and rocks, sandy and loamy soils and pastures. Hu, Mo, Pl, Ro, Sk, Uk.

**2475. *Androsace lactea* L.** — Annual, scarcely tufted, rhizome with short (3 cm) shoots and rosettes of basal leaves, flower stalks (1-4) glabrous, 3-15 cm high. **Seeds of various shapes, mostly prolonged trianguloid, more or less flattish, dorsal side convex, ventral flat or concave, 2.3-2.8 x 1.4-1.7 mm. Surface waved, lustrous, dark-brown.**  $2n = 76$ .

Native to mountains of Europe, on calcareous rocks and screes in subalpine and alpine zones. Pl, Ro, Sk.

**2476. *Androsace maxima* L.** — Annual, leaves form a basal rosette, flower stalks 3-10 cm long. **Seeds irregular shaped, obovoid, oval, rooflike or angular, often flattish, margins serrate, 2-2.5 x 1.2-1.6 mm. Surface horizontal waved, dull, dark-brown.**  $2n = 58-60$ . Native to Eurasia, in dry open habitats, steppes, fields, calcicole to some extent. Hu, Mo, Pl, Ro, Sk, Uk.

**2477. *Androsace obtusifolia* All., *A. lachenalii* Gmel.** — Perennial, rhizome tufted, many-headed, with basal leaf rosettes, flower stalks (1-4) glabrous, 3-15 cm high. **Seeds oval, obovoid, trianguloid, dorsal side convex, ventral rooflike with oblong hilum, 2.1-2.5 x 1.1-1.4 mm. Surface reticulate, lustrous, dark-brown.**  $2n = 36, 38$ . Native to mountain of central Europe, on rocks and screes, meadows and slopes, a calcifuge. Pl, Ro, Sk.

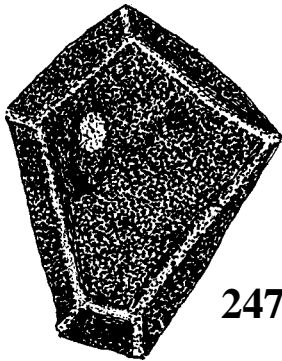
**2478. *Androsace sarmentosa* Wall.** — Perennial, plant with many regular rosettes, stems 10-15 cm high, fast reproduction by shoots. **Seeds oblong-ellipsoid, dorsal side convex, ventral rooflike, around narrowly winged, 2.6-3.3 x 1.2-1.6 mm. Surface reticulate-areolate, lustreless, dark-violet.** Native to Himalayas, in montane sandy stands; in the Carpathians often cultivated in rock-gardens.

**2479. *Androsace septentrionalis* L.** — Annual, basal leaves form a rosette, flower stalks (1-15) erect, 8-30 cm high, flowers white or reddish. **Seeds multiangular or triangular, pyramidal, with distinct ribs, 0.8-1.2 x 0.6-0.8 mm. Surface reticulate, slight lustrous, dark-brown.**  $2n = 20$ . Native to Europe, on blown sands, fallows, steppe grasslands, fields, a calcifuge. Br, Mo, Pl, Ro, Sk, Uk.

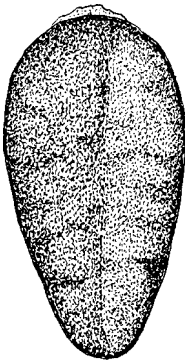
**2480. *Androsace villosa* L., *A. arachnoidea* Scott; Nym. et Kotschy** — Perennial, a small plant, with soft, about 2 cm long lateral shoots. **Seeds elliptic-triangular, pyramidal or irregular shaped, 2-2.6 x 1.4-1.8 mm. Surface tuberculate, lustrous, reddish-brown.**  $2n = 20$ . Native to Eurasia, in subalpine and alpine zones, on rocks and screes, stony and turfey slopes, calcicole. Ro, Uk.

**2481. *Cortusa matthioli* L., *Androsace primuloides* Moench** — Perennial, leaves (3-7) in a basal rosette, flower stalk 15-30 cm high with 2-8 white or reddish flowers. **Seeds of irregular shape and size, angular**

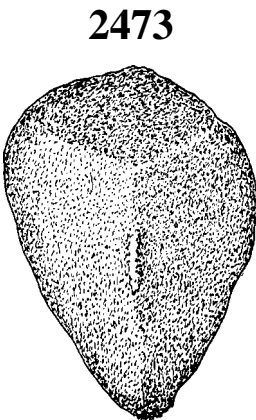




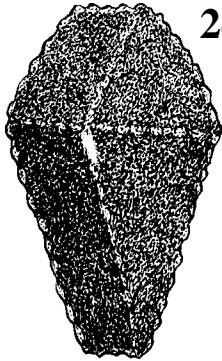
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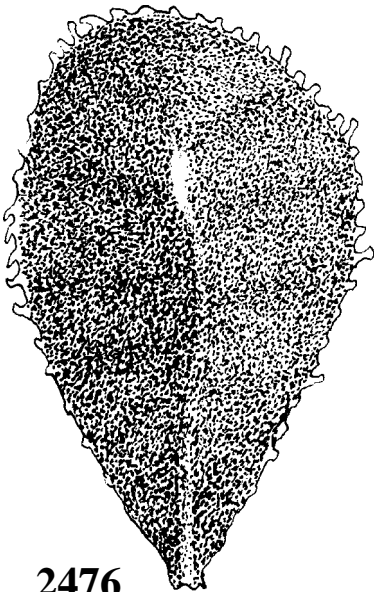
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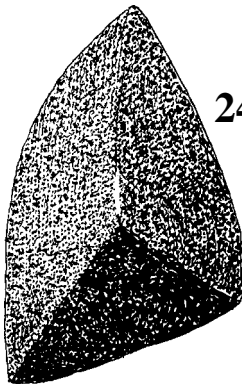
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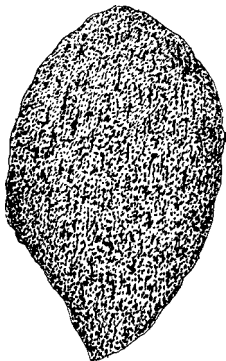
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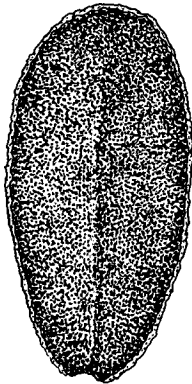
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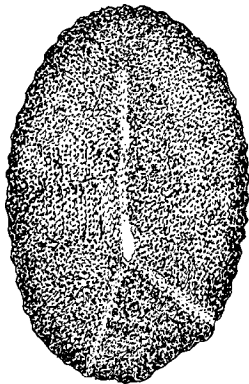
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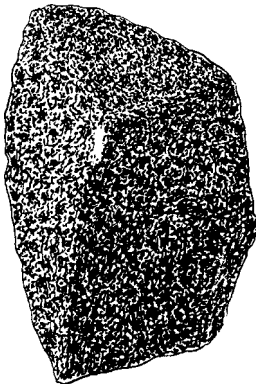
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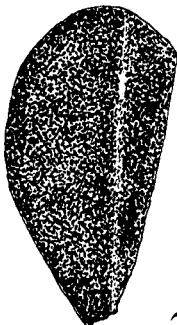
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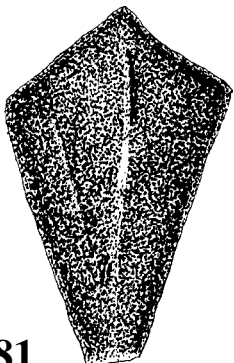
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2481



or rounded, 1.2-1.8 x 0.8-1.2 mm. Surface reticulate, dull or slight lustrous, dark-brown.  $2n = 24$ . Native to Europe, in moist humous woodlands, on shady rocks, along brooks margins, in calcareous stands of montane and subalpine zones; in all Carpathian territories.

**2482. *Soldanella carpatica*** Vierh., *Soldanella alpina* auct. non L. — Perennial, basal leaves 1-5 cm in diam.  $\pm$  rounded, flower-stalks 5-15 cm, umbel with 2-5 flowers. **Seeds of very irregular shape and size, elliptic, rhombic, ovoid, with faint distinct angles, suture or hilum, 1-1.6 x 0.6-1 mm. Surface wrinkly, slight lustrous or dull, pale reddish-brown.  $2n = 40$ .** Native to the West Carpathians, on moist rocks, mountain woodlands, on stony, basic and non-basic, humous substrates. Pl, Sk.

**2483. *Soldanella hungarica*** Simonk., *S. montana* subsp. *hungarica* (Simonk.) Lüdi — Perennial, basal leaves roundly reniform, flower-stalks 3-10 cm, umbels with 2-4 flowers. **Seeds very irregular shaped, ellipsoid, rhombic or ovoid, in some cases narrow winged on one side, 1-1.6 x 0.6-1 mm. Surface fine granulate, slight lustrous, yellowish-brown.  $2n = 40$ .** Native to the mountains of eastern and southern Europe, in shady, humous forests, coastal shrubs, up to the upper forest border. Pl, Ro, Sk, Uk.

**2484. *Soldanella montana*** Willd. — Perennial, basal leaves rounded or reniform, sometimes with crenate brim, flower stalk 5-25 cm high, umbels with 6-8 flowers. **Seeds various shaped, reniform, ellipsoid, rhombic, mostly with indistinct angles, slight flattish, 1.3-1.8 x 0.7-1.0 mm. Surface fine reticulate, lustrous, yellowish-brown.  $2n = 40$ .** Native to the mountains of central and southern Europe, in woods and meadows, a calcifuge, at altitudes from 700 to 1600 m, in poor soils. Pl, Ro, Sk, Uk.

**2485. *Soldanella pusilla*** Baumg. — Perennial, a plant up to 9 cm high, young leaves glandular, glabrous, reniform. **Seeds ellipsoid, rhombic, reniform or of other irregular forms, with faint distinct angles, in some case flattish, 1-1.3 x 0.6-0.8 mm. Surface slight lustrous, fine reticulate, yellowish.** Native to the mountains of the Alps, Carpathians, Balkan Peninsula and the Apennines, on wet pastures and rocks, at altitudes from 450 to 3000 m. Ro.

**2486. *Cyclamen fatrense*** Halda et Soják, *C. europaeum* L. subsp. *orbiculatum* (Mill.) Schwarz —

Perennial, very similar to *C. purpurascens*, leaves on facial side weakly dark-green (not azure or silverish). **Seeds very irregular shaped, ellipsoid, rhombic or of other shape, 3-4 x 2.2-2.8 mm. Surface distinct reticulate, slight lustrous, brown to dark-brown.  $2n = 34$ .** Endemic to Slovak mountains, gorges and screes with shrubberies, wet, humous soils. Sk.

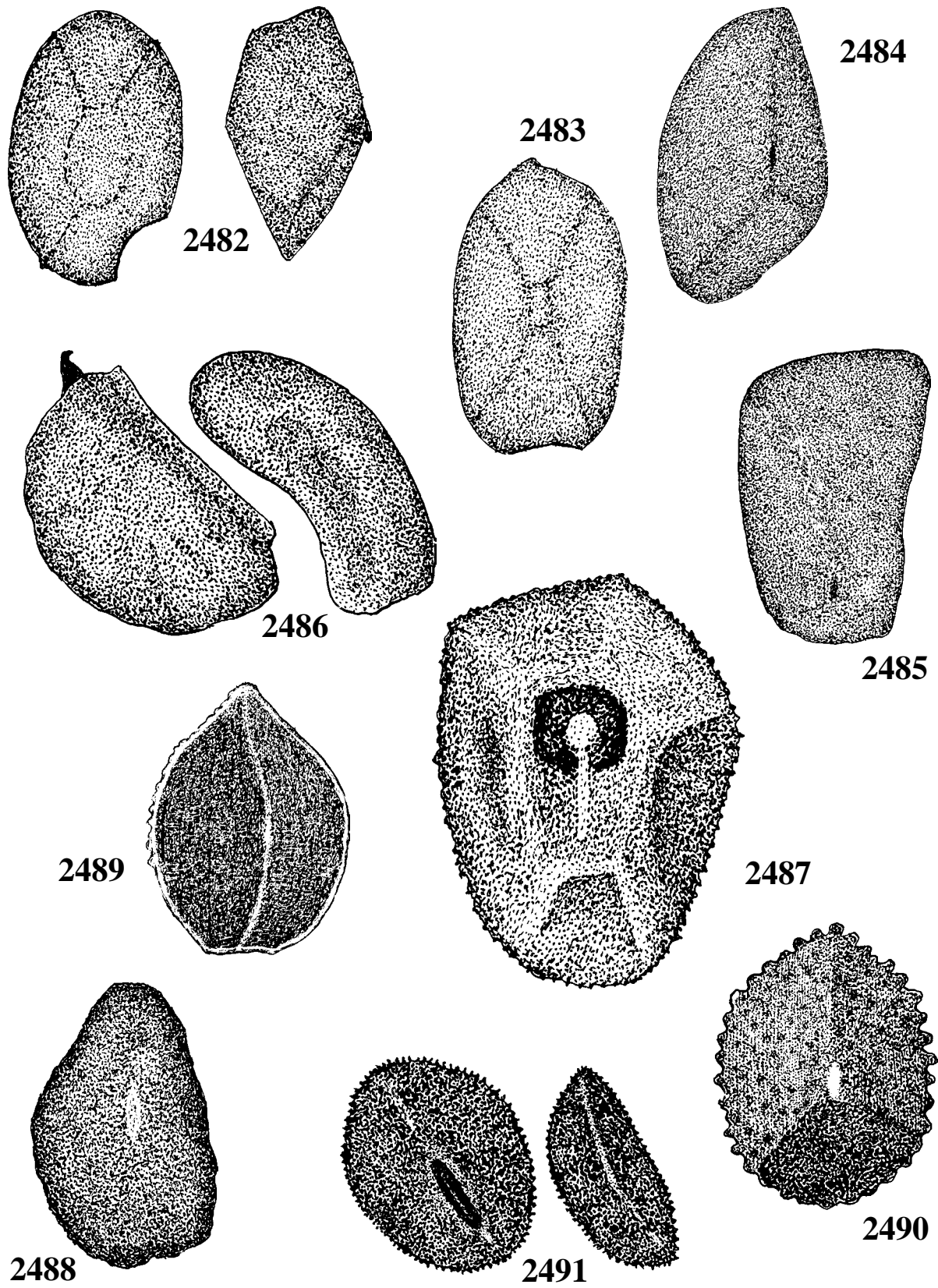
**2487. *Cyclamen persicum*** Mill. — Perennial, a plant with rhizome, rounded leaves and very attractive flowers, flowering from January to May. **Seeds with a wide palette of shapes and sizes, mostly rhombic, angular, 3-4 x 2.4-3 mm. Surface distinct granulate, lustrous, dark violet-brown.** Native to southwestern Asia; in Europe commonly cultivated in pots as an apartment flower, in a rich palette of cvs.

**2488. *Cyclamen purpurascens*** Mill., *C. europaeum* auct. non L. — Perennial, bulbs 2-5 cm in diam., with rootlets on the surface. **Seeds of various shapes, mostly irregular rhombic, globular or ellipsoid, flattish, 2.5-3.5 x 1.6-2.2 mm. Surface reticulate, dull or slight lustrous, violet-brown.  $2n = 34$ .** Native to the mountains of Europe, in deciduous forests and shrubs with fresh, wet eutrophic calcareous soils. Hu, Pl, Ro, Sk, Uk.

**2489. *Lysimachia ciliata*** L. — Perennial, stems 50-130 cm high, erect, glabrous, flowers solitary or in pairs. **Seeds angular, dorsal side slight convex, ventral sides rooflike, hilum indistinct, 1.8-2.1 x 1.3-1.5 mm. Surface fine reticulate, dull, dark violet-brown.** Native to North America; in the Carpathians rarely cultivated for ornament and locally naturalized.

**2490. *Lysimachia nemorum*** L., *Ephemerum nemorosum* (L.) Rchb. — Perennial, evergreen, glabrous, stems procumbent to ascending, 10-40 cm, unramified, knots rooting down only at the bottom. **Seeds elliptic or ovoid to globular with distinct hilum, 1.2-1.6 x 1-1.3 mm. Surface rough grained, rugose, dull, blackish-brown.  $2n = (16), 18 (28)$ .** Native to central and western Europe, in damp or shady places, at brook edges, in wet pastures and shrubberies. Pl, Ro, Sk, Uk.

**2491. *Lysimachia nummularia*** L., *Nummularia repens* Gilib. — Perennial, evergreen, glabrous, stems 10-50 cm long, creeping, rooting down on knots. **Seeds mostly prolonged ellipsoid, rhombic, reniform, pyramidal, 1-1.5 x 0.6-1 mm. Surface with acute angles, distinct reticulate with hyaline white**



scales, dull, dark-brown.  $2n = (32), 36 (43, 45)$ . Native to Eurasia, in wet and shady forests, shrubberies, meadows, ditches, mats in parks and gardens; throughout the Carpathians.

**2492. *Lysimachia punctata* L., *L. villosa* F. W. Schmidt, *L. verticillaris* Sprengel** – Perennial, stems erect, 30-100 cm high, puberulent, with a thin rhizome. **Seeds mostly prolonged ellipsoid, dorsal side convex, two ventral sides flat, narrowed at both ends into a distinct rib, 1.2-1.6 x 0.7-0.9 mm. Surface reticulate, dull, blackish-brown.  $2n = 30$ .** Native to Eurasia, near springs, on mountain meadows, shrubberies, riverbanks and in other wet places, cultivated for ornament and widely naturalized, also in lowlands.

**2493. *Lysimachia vulgaris* L.** – Perennial, stems erect, ramified, 50-150 cm high, pubescent. **Seeds mostly rhombic, with a distinct border around the whole seed, flattish or pyramidal, 1.3-1.8 x 1-1.3 mm. Surface foveolate, dull, prolonged hilum dark, ribbed around, pinkish.  $2n = 28, 42, 56, 84$ .** Native to Eurasia, in mountain meadows, fens, wet woods, lake- and river-sides. Hu, Mo, Pl, Ro, Sk, Uk.

**2494. *Naumburgia thyrsiflora* (L.) Rchb., *Lysimachia thyrsiflora* L.** – Perennial, stems erect, 30-70 cm high unramified, densely leafy, usually glabrous. **Seeds ellipsoid or globose flattish, dorsal side convex with or without the rib, ventral side also convex, with prolonged hilum, 1.1-1.5 x 1-1.3 mm. Surface fine foveolate, dull, rose-brown.  $2n = 20, 40, 54$ .** Native to Europe, in shady and blind river arms, reeds, muddy places, wet lowland forests. Hu, Ro, Sk, Uk.

**2495. *Trientalis europaea* L.** – Perennial, stems erect, 5-30 cm high, unramified, scaly on bottom. **Seeds ellipsoid or globose, flattish, placed in light-grey, reticulate netlet, netlet size 1.6-2 x 1.3-1.6 mm, seed size 1.4-1.8 x 1.2-1.5 mm. Surface of the seed minute reticulate, dull, black.  $2n = 100, 112, c. 160$ .** Native to northern Europe, in shady, moist coniferous woods, rare in mixed woodlands or heath, on wet, marshy, acid soils, mostly in mountains. Br, Pl, Ro, Sk, Uk.

**2496. *Glaux maritima* L.** – Perennial, stems 5-30 cm high, ascending or erect, with knots at the bottom rooting down, tiny, pulpy,  $\pm$  pubescent. **Seeds mostly prolonged trigonal ellipsoid, narrowed to both ends, dorsal side convex, ventral side also convex**

**with prolonged hilum on indistinct rib, 1.2-1.6 x 0.7-1 mm. Surface minute reticulate, dull, brown to blackish-brown.  $2n = 30$ .** Native to Europe, in maritime habitats and saline inland soils, wet muddy places and marshy grounds. Hu, Mo, Pl, Ro, Sk, Uk.

**2497. *Samolus valerandii* L.** – Perennial, stems erect, 10-60 cm high, leafy, glabrous, few branched. **Seeds irregular polyhedral, trigonal, dorsal side convex, two ventral sides flat, 0.5-0.6 x 0.3-0.4 mm. Surface minute tuberculate, dull, reddish-brown.  $2n = 24, 26$ .** Native to western and central Europe, in wet, usually saline or calcareous habitats, near water, in damp sandy places; throughout the Carpathians.

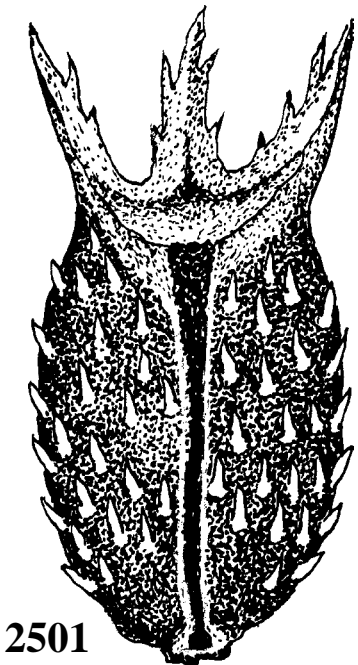
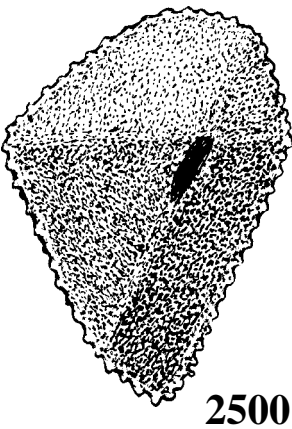
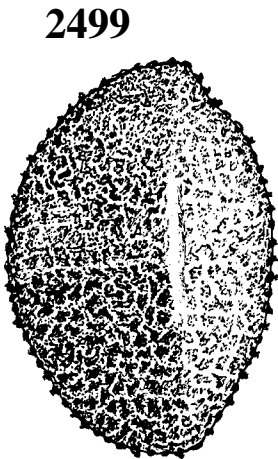
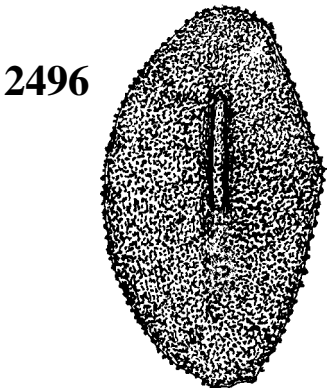
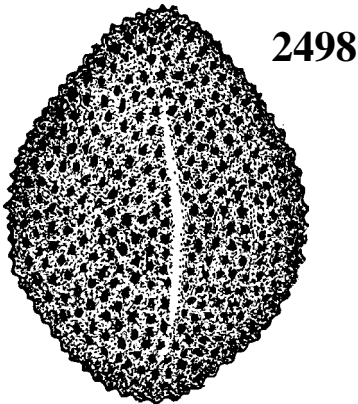
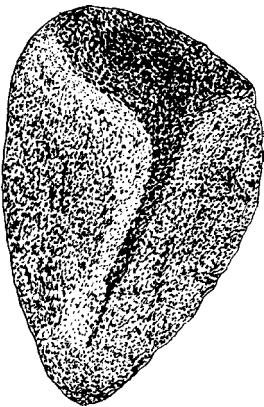
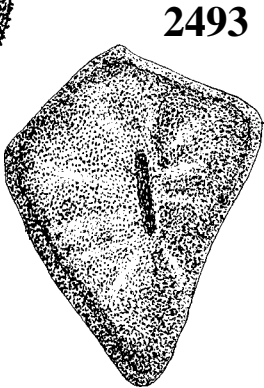
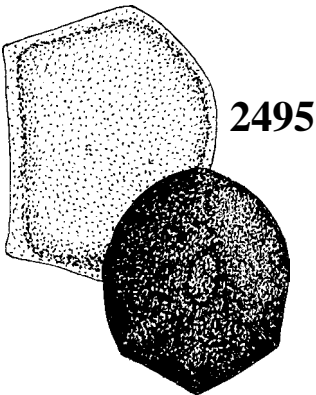
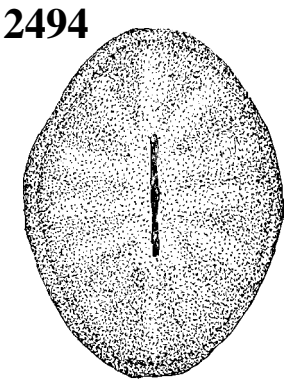
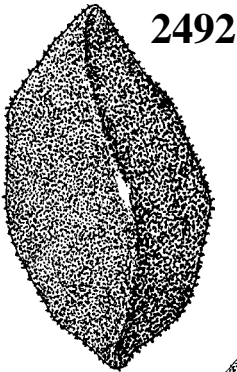
**2498. *Centunculus minimus* L., *Anagalis minima* (L.) E. H. L. Krause** – Annual, tiny, glabrous, stem ascendent or erect, 1-10 cm high, densely leafy, branched from base. **Seeds triquetrous or deltoid, dorsal side convex, two ventral sides flat with white suture and indistinct hilum, 0.5-0.7 x 0.4-0.6 mm. Surface fine tuberculate, dull, dark-brown.  $2n = 22$ .** Native to Eurasia, on wet stubbles, ditches, stripped riverbanks, sandbanks, muddy non-calcareous soils. Hu, Pl, Ro, Sk, Uk.

**2499. *Anagalis arvensis* L., *A. carnea* Schrank** – Annual to biennial, stems ascendent to erect, 10-15 cm high, 4-angular, branched, flowers brick-red. **Seeds triquetrous ellipsoid, dorsal side flat, two ventral sides  $\pm$  flat with prolonged light hilum on suture, 1.2-1.5 x 0.8-1 mm. Surface dull, rough, papillate, dark-brown.  $2n = 40$ .** Native to Eurasia, now a cosmopolite, mostly in marshy or irrigated alluvial soils, cultivated grounds, waste places and maritime sands; throughout the Carpathians.

**2500. *Anagalis foemina* Mill., *A. caerulea* Schreb.** – Annual to biennial, stems  $\pm$  erect, 10-15 cm high, branched, flowers blue. **Seeds polyquetrous, dorsal side flat, two up to five ventral sides  $\pm$  flat, hilum prolonged, 1.2-1.6 x 0.8-1.2 mm. Surface dull, hyaline papillate, dark-brown, hilum darker than the surface.  $2n = 40$ .** Native to the Mediterranean, now a cosmopolite, in cultivated grounds, waste places, clay and sandy banks, scrubs. Hu, Mo, Pl, Ro, Sk, Uk.

## 119. RUBIACEAE

**2501. *Sherardia arvensis* L.** – Annual, stems up to 40 cm high, procumbent, somewhat scabrid with small deflexed prickles, flowers in small terminal heads. **Fruits double achenes, ellipsoidal, scabrous, dorsal**



side convex, ventral  $\pm$  flat, with deep furrow (suture) in the middle, with 3 prickles on apex, 3.2-3.8 x 1.5-1.9 mm. Surface aculeate, dull, pale-brown.  $2n = 22$ . Native to Europe, on cultivated grounds, dry grasslands, as a weed in fields and fallows; in all Carpathian regions.

**2502. *Asperula aristata*** L. fil. — Perennial, stems 10-60 cm high, often shortly papillose-hairy below, usually subglabrous above. **Fruits double achenes, ellipsoid, dorsal side convex, ventral concave with longitudinal furrow in the middle, 1.9-2.2 x 1.1-1.3 mm. Surface papillose, rare hairy, dull, pale- or reddish-brown.  $2n = 20$ .** Native to southern Europe, in montane to subalpine zones; in the Carpathians only dubious in Romania.

**2503. *Asperula arvensis*** L. — Annual, stems 10-50 cm high, erect, ramified, leaves lanceolate. **Fruits double achenes, spherical, dorsal side convex, ventral flat, with deep hilum, 2.1-2.8 mm in diam. Surface glabrous, dull, dark-brown with small oblong, paler spots.  $2n = 22$ .** Native to southwestern Asia; hauling into the Carpathians with cereals, naturalized in fields, fallows, vineyards, waste places in warmer areas.

**2504. *Asperula capitata*** Kit. ex Schultes — Perennial, stems 10-35 cm high, shortly hairy only at base, ascending to erect, laxly caespitose. **Fruits double achenes,  $\pm$  ellipsoidal, dorsal side convex, ventral concave, with longitudinal deep furrow, apex truncate, bottom narrowed, with roundish hilum, 1.9-2.2 x 1.3-1.5 mm. Surface coarse, dull, dark-brown.  $2n = 22$ .** Native to southeastern Carpathians, on calcareous mountain rocks. Ro.

**2505. *Asperula cynanchica*** L., *Galium cynanchicum* (L.) Scop. — Perennial, stems 10-50 cm high, ascending to erect, herbaceous, with short hairs at base, subglabrous above. **Fruits double achenes, elliptic or oval, moony-shape, dorsal side convex, ventral concave, with oblong furrow in the middle, 1.5-2.2 x 0.9-1.2 mm. Surface papillose-tuberculate, dull, brown.  $2n = 20$ .** Native to Europe, on steppe and stony slopes, dry meadows, wood steppes, in warmer areas; in all Carpathian regions.

**2506. *Asperula hungarorum*** Borbás, *A. banatica* Holub, *A. ciliata* Rochel non Moench, *A. tinctoria* L. subsp. *hungarorum* (Borbás) Soó — Perennial, stems erect, 4-angular, branched, 20-60 cm high, leaves broadly lanceolate. **Fruits double achenes,**

**elliptic, angular, concavo-convex, longitudinal and transversal ribbed, 2.9-3.3 x 2-2.3 mm. Surface scalariform, lustrous, dark-greyish.  $2n = 22$ .** Native to eastern-central and southern Europe; in scrubs and grassy places. Sk.

**2507. *Asperula montana*** Waldst. et Kit., *A. rumelica* Boiss. — Perennial, stems erect, 10-90 cm high, sometimes woody at base. **Fruits double achenes, elliptic, dorsal side convex, ventral concave, with oblong furrow in the middle, apex truncate, 1.4-1.6 x 0.9-1.1 mm. Surface papillose-tuberculate, dull, dark-brown.  $2n = 20-40$ .** Native to southern Europe, on sunny, grassy slopes, stony, ventral to basic soils. Mo, Ro, Sk, Uk.

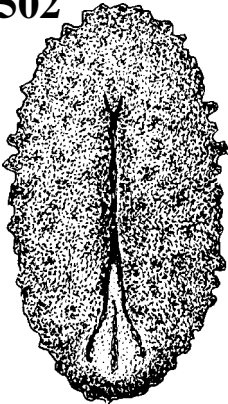
**2508. *Asperula orientalis*** Boiss. et Hohen., *A. azurea* Jaub. et Spach — Annual, stems 10-50 cm high, erect ramified, leaves linear-lanceolate, 4 leaves below and 6 leaves above in verticils. **Fruits double achenes, elliptic or spherical, dorsal side convex, ventral flat, with deep hilum and oblong furrow, 1.8-2 x 1.3-1.8 mm. Surface smooth, dull, yellowish-brown, with oblong pale spots.  $2n = 22$ .** Native to southwestern Asia, often cultivated in gardens for ornament. Ro.

**2509. *Asperula purpurea*** (L.) Ehrend., *Galium purpureum* L. — Perennial, stems 15-60 cm high, ascending to erect, weakly 4-angled, with short  $\pm$  curved hairs. **Fruits double achenes, obovate, reniform, dorsal side convex, ventral concave, with oblong furrow and roundish hilum below, 1.6-1.9 x 1.2-1.4 mm. Surface glabrous, undulate to longitudinal furrowed, lustrous, dark-brown.  $2n = 22$ .** Native to southern Europe, in dry places. Ro.

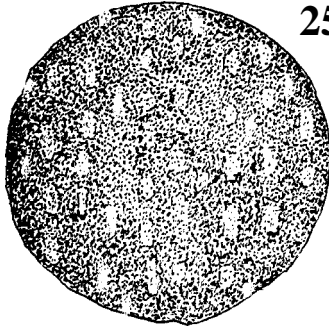
**2510. *Asperula setulosa*** Boiss. — Perennial, stems 4-angular, 30-50 cm high, procumbent or ascending, branched. **Fruits double achenes, ellipsoidal, convexo-concave, with longitudinal furrow in the middle of the ventral side, 3-3.4 x 1.9-2.1 mm. Surface dense covered with squamose tubercles, dull, brown.** Native to southeastern Europe, on sandbanks of the Black Sea coasts.

**2511. *Asperula taurina*** L. — Perennial, stems up to 50 cm high, little branched, internodes and hairs long. **Fruits double achenes, spherical, dorsal side convex, ventral concave, with oblong hilum, 3-3.4 mm in diam. Surface papillose-tuberculate or glabrous, dull, greenish, brownish to blackish.** Native to southern Europe, in

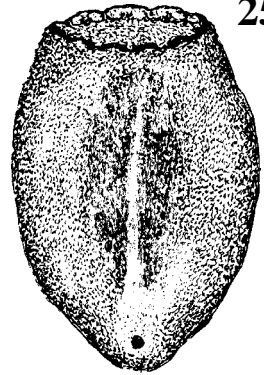
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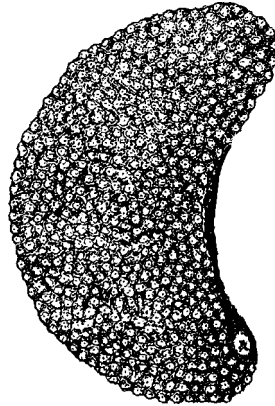
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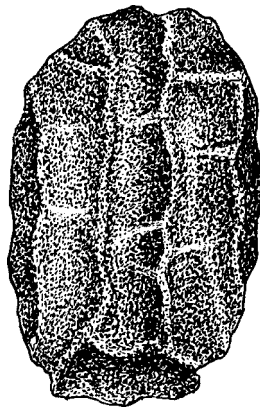
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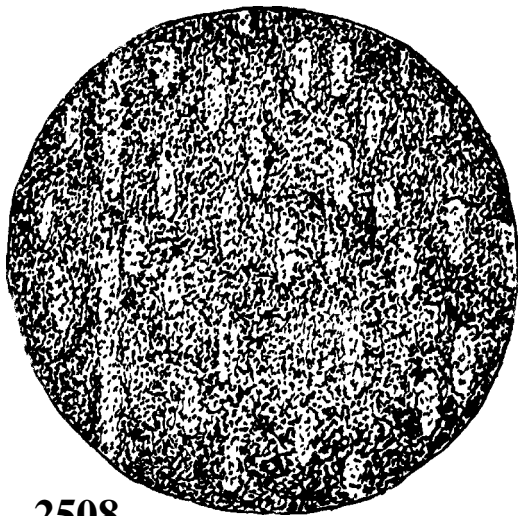
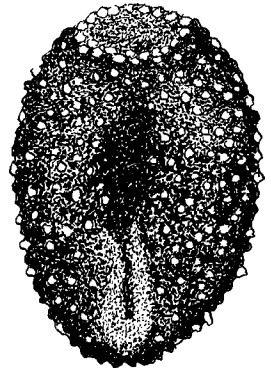
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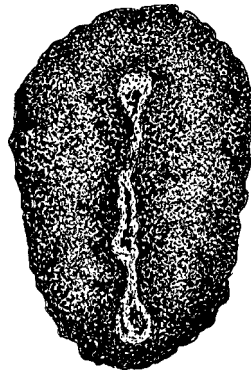


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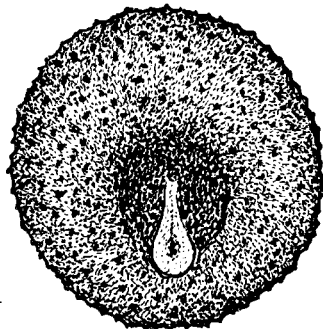


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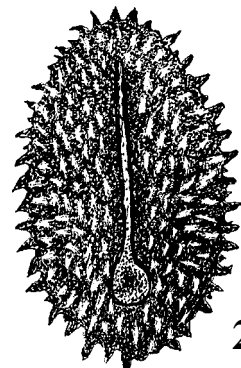
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2510



deciduous woods and scrubs, up to the montane zone. Hu, Ro.

**2512. *Asperula tenella*** Heuffel ex Degen, A. *montana* Grec. — Perennial, stems 35-50 cm high,  $\pm$  erect, usually shortly papillose-hairy especial below, often much branched from base. **Fruits double achenes, ellipsoidal, dorsal side convex, ventral concave, with longitudinal furrow in the middle, 1.8-2 x 1-1.2 mm. Surface papillose, lustreless, pale-brown.** Native to southeastern Europe, in plains and on hills. Ro.

**2513. *Asperula tinctoria*** L., *Galium tinctorium* (L.) Scop. — Perennial, stems 20-70 cm high, erect, robust, more or less branched from the base, 4-angled, mostly glabrous, plants usually blackening on drying. **Fruits double achenes,  $\pm$  angular-ellipsoid, dorsal side  $\pm$  convex, ventral flat or concave, with oblong furrow and hilum, 2.1-2.5 x 1.5-1.7 mm. Surface fine reticulate-areolate, lustrous, blackish-brown.  $2n = 22, 44$ .** Native to Europe, in light woods and scrubs, steppy meadows, overgrown rocks. Hu, Pl, Ro, Sk.

**2514. *Galium album*** Mill., *G. erectum* Huds. — Perennial, stems 50-150 cm high, erect to procumbent, branches ascending or patent, glabrous or hairy, internodes long. **Fruits double achenes, crescent-shaped, dorsal side convex, ventral concave, with narrow, oblong hilum in the centre, 1.6-2 x 1.1-1.3 mm. Surface reticulate-areolate, slight lustrous, brown.  $2n = 44$ .** Native to Euro-Siberia, on dryer meadows, pastures, scrubs; in warmer areas of all Carpathian regions.

**2515. *Galium anisophyllum*** Vill., *G. asperum* subsp. *anisophyllum* (Vill.) R. Schust. — Perennial, stems 10-25 cm high, slender to stout, glabrous and smooth, or with patent hairs, scarcely reddish at the base. **Fruits double achenes, spherical or slight ellipsoidal, dorsal side convex, with some shallow, faint distinct furrows, ventral concave, with deeper furrow in the middle, 1.2-1.5 x 1-1.2 mm. Surface nearly smooth, obtuse papillose, faint lustrous, dark-brown.  $2n = (22, 44), 66 (88-110)$ .** Native to Europe, on rocks, screes, alpine meadows, pastures. Pl, Ro, Sk.

**2516. *Galium aparine*** L. — Annual, stems 20-150 cm high, often stout and hairy at the nodules, procumbent or trailing, 4-angular. **Fruits double achenes,**

**spherical or faint elliptic, ventral side concave with hilum in the middle, 3-3.5 x 2.7-3.2 mm. Surface dense bristly hooked, dull, greyish-brown.  $2n = 42 (44), 48, 62, 66, 68$ .** Native to Eurasia, in woods, scrubs, hedges, cultivated grounds; in all Carpathian regions.

**2517. *Galium austriacum*** Jacq. — Perennial, stems 10-30 cm high, usually glabrous, sometimes with patent hairs, red at the base. **Fruits double achenes,  $\pm$  globose or elliptic, ventral side concave with rounded hilum, dorsal side convex, 1-1.2 x 0.8-1 mm. Surface smooth or obtuse papillose, faint lustrous, yellowish- to dark-brown.  $2n = 22, 44$ .** Native to southern and central Europe, in grasslands and coniferous woodlands, calcicole. Hu, Sk.

**2518. *Galium boreale*** L. — Perennial, stems 30-65 cm high, erect, 4-angled, usually glabrous, rarely hairy. **Fruits double achenes, reniform, dorsal side convex, ventral concave, with oblong furrow in the middle, 1.5-2 x 0.9-1.1 mm. Surface with short, appressed or patent-hooked hairs, or glabrous, faint lustrous or dull, dark-brown.  $2n = 44 (55), 66$ .** Native to Eurasia, in moist meadows, fen-lands, moist woods and scrubs; throughout the Carpathians.

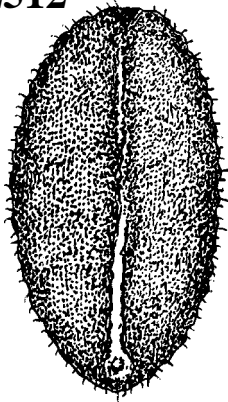
**2519. *Galium constrictum*** Chaub., *G. debile* Desv. — Perennial, stems 10-80 cm high,  $\pm$  erect, smooth or retrorsely aculeate on the 4 angles. **Fruits double achenes, elliptic, concavo-convex, with large hilum on ventral side, 2.4-3 x 1.7-1.9 mm. Surface distinct tuberculate, dull, dark-brown.  $2n = 24$ .** Native to southwestern Europe, in wet places, marshes. Ro.

**2520. *Galium divaricatum*** Pourr. ex Lam. — Annual, stems 5-30 cm high, erect, slender, nearly smooth above. **Fruits double achenes, obovoid or ellipsoid, dorsal side convex, ventral concave, with large and deep hilum, 0.7-0.8 x 0.5-0.6 mm. Surface fine papillose, faint lustrous or dull, blackish-brown.  $2n = 44$ .** Native to Europe, on dry fallows, sandy fields with non-calcareous soils. Hu, Ro, Sk.

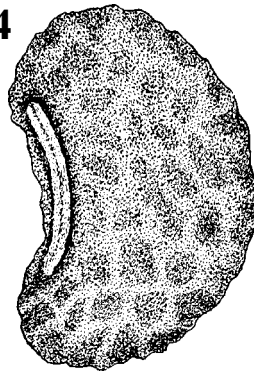
**2521. *Galium elongatum*** C. Presl., *G. palustre* subsp. *elongatum* (C. Presl) Lange — Perennial, stems rough, 50-150 cm high, 4-angular bristled at edges. **Fruits double achenes,  $\pm$  spherical or slight oval, 1.2-1.5 x 1-1.3 mm. Surface glabrous or mammilate, dull, dark-brown.  $2n = 96, 144$ .** Native to Europe, in lowland forests, coastal shrubberies, reeds, wet to muddy places. Hu, Ro, Sk.



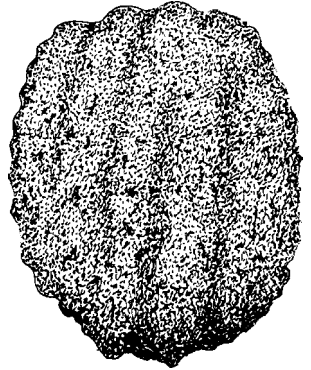
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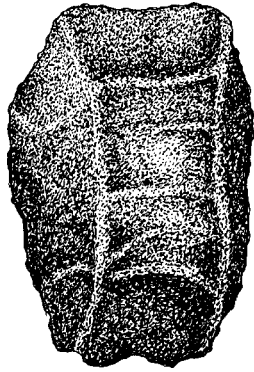
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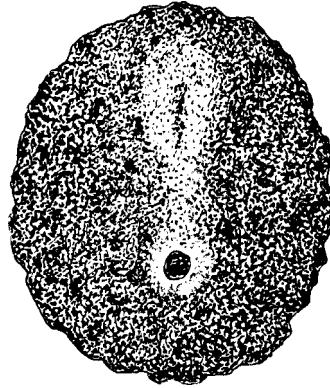
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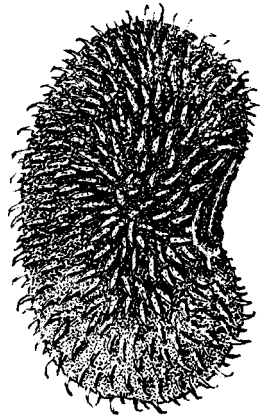
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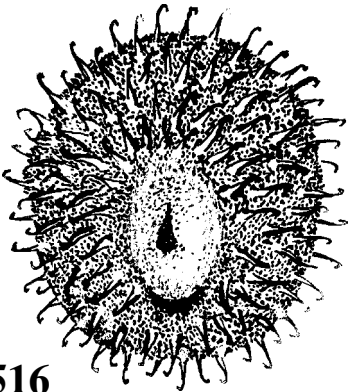
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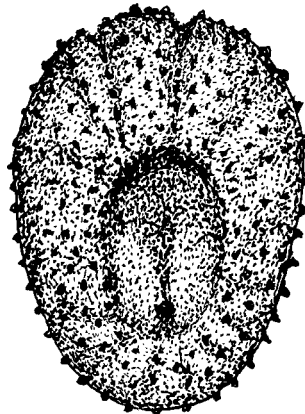
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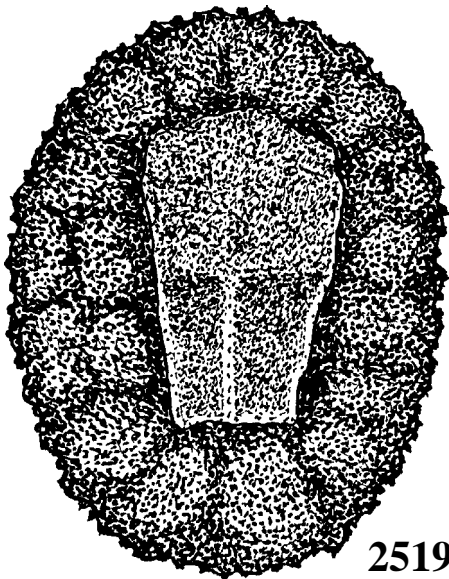
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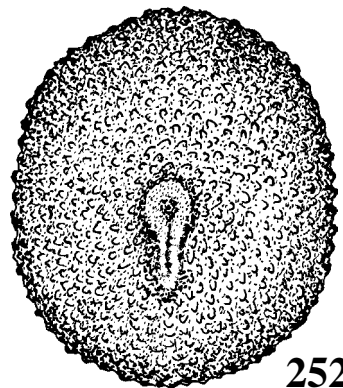
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**2522. *Galium flavescens*** Borbás – Perennial, stems up to 80-100 cm high, robust, strongly branched from the base, glabrous or with short hairs. **Fruits double achenes, elliptic, dorsal side convex, ventral flat or concave with hilum, 1-1.3 x 0.7-0.9 mm. Surface strong wrinkly, lustreless, dark-brown. 2n = 44.** Native to southern Europe, in dry places. Ro.

**2523. *Galium fruticosum*** Willd., *G. junceum* Sibth. et Sm. – Perennial, stems rigid, ligneous, branched, glabrous. **Fruits double achenes, obovate, dorsal side convex, ventral with a deep longitudinal furrow, 1.3-1.5 x 0.9-1.1 mm. Surface rugose, slight lustrous, pale or dark-brown.** Native to southeastern Europe, in stony stands. Ro (?).

**2524. *Galium glaucum*** L., *Asperula glauca* (L.) Besser – Perennial, stems 40-80 cm high, usually rounded, with 4 ridges, stout, glabrous or hairy. **Fruits double achenes, obovate or elliptic, from lateral view reniform, dorsal side convex, ventral concave with hilum, 1.7-1.9 x 1.3-1.5 mm. Surface strong wrinkly, lustreless, dark-brown. 2n = 44.** Native to Europe, on sunny stony and steppe slopes, forest steppes, in shallow calcareous stands of warmer areas. Ro, Sk, Uk.

**2525. *Galium humifusum*** M. Bieb., *Asperula humifusa* (M. Bieb.) Besser – Perennial, stems 40-150 cm high, decumbent to ascending, usually branched from the base, 4-angled, hairy below. **Fruits double achenes, ± globose, dorsal side convex, ventral concave with hilum, 1.1-1.2 x 1-1.1 mm. Surface wrinkly, lustrous, fine hairy, dark-brown.** Native to southeastern Europe, in damp and bushy places. Mo, Ro, Uk.

**2526. *Galium kitaibelianum*** Roem. et Schult. – Perennial, stems 50-100 cm high, much branched, 4-angled, usually glabrous, rarely hairy. **Fruits double achenes, spherical or oval, dorsal side convex, ventral flat or concave with large hilum, 1.7-1.9 x 1.5-1.7 mm. Surface strong wrinkly, lustreless, dark-brown. 2n = 22.** Native to southwestern and central Romania, in open woods, especially in rocky stands. Ro.

**2527. *Galium lucidum*** All., *G. rigidum* Vill. – Perennial, stems 25-70 cm high, erect or ascending, glabrous or hairy, with few non-flowering branches. **Fruits double achenes, ellipsoidal, dorsal side convex, ventral with long longitudinal furrow, usually from the bottom to the apex, 1.2-1.6 x**

**0.9-1.2 mm. Surface wrinkly, with one or more indistinct furrows on dorsal side, lustreless, dark-brown. 2n = 44.** Native to Eurasia, on dry meadows and pastures, boundaries, steppe slopes, in light woods and scrubs. Hu, Pl, Ro, Sk.

**2528. *Galium mollugo*** L., *G. elatum* Thuill. – Perennial, 30-150 cm high, usually glabrous, ascending to weakly procumbent, with numerous branches. **Fruits double achenes, oval or globose, dorsal side convex, ventral concave with oblong furrow and hilum, 1-1.4 x 0.9-1.12 mm. Surface irregular reticulate-areolate, faint lustrous, dark-brown. 2n = 22.** Native to Eurasia, on hay-meadows, scrubs, at forest margins; throughout the Carpathians.

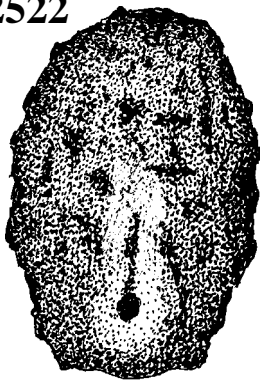
**2529. *Galium octonarium*** (Klokov) Pobed., *Asperula octonaria* Klokov – Perennial, stems 25-90 cm high, ± 4-angled throughout, usually glabrous. **Fruits double achenes, ellipsoidal, dorsal side convex usually with 3-4 shallow longitudinal furrows, ventral side with long and deep longitudinal furrow and rounded hilum, 1.5-1.7 x 0.9-1.1 mm. Surface irregular reticulate-areolate, faint lustrous, dark-brown. 2n = 22.** Native to southeastern Europe, in dry, stony grasslands and steppes. Mo, Ro, Uk.

**2530. *Galium odoratum*** (L.) Scop., *Asperula odorata* L. – Perennial, stems 10-25 cm high, erect, 4-angled, glabrous except the ring of hairs at the nodules. **Fruits double achenes, globose or slight ellipsoidal, dorsal side convex, ventral deep concave, with roundish hilum, 3.4-4 x 3.4-4.2 mm. Surface dense bristly hooked, hairs 0.5-1 mm long, dull, dark-brown. 2n = 44.** Native to Eurasia, in shady base-rich deciduous woods; in all Carpathian territories.

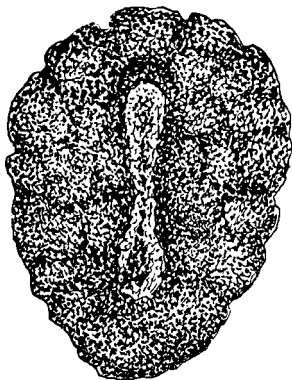
**2531. *Galium palustre*** L. – Perennial, stems 15-70 cm high, slender, procumbent to erect, smooth or ± retrorsely aculeate at the scarcely whitish angles. **Fruits double achenes, ± spherical, dorsal side convex, ventral concave with oblong hilum, 1.4-1.6 mm in diam. Surface ± wrinkly to smooth lustreless, dark-brown. 2n = 24, 48.** Native to Euro-Siberia, in moist meadows, lowland woods, peatbogs, ditches; in all Carpathian territories.

**2532. *Galium parisiense*** L. subsp. *anglicum* (Huds.) Arcang. – Annual, stems 10-25 cm high, erect, 4-angular, gracile, much ramified from base, leaves linear lanceolate. **Fruits double achenes, elliptic**

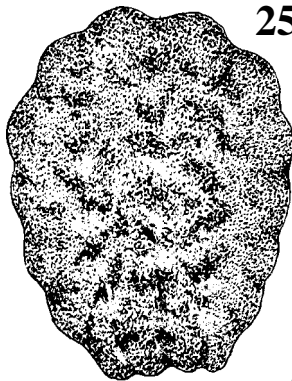
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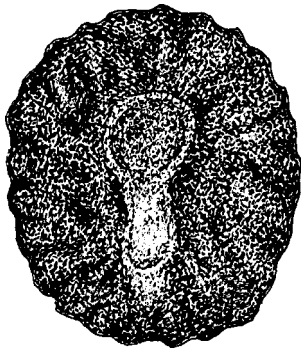
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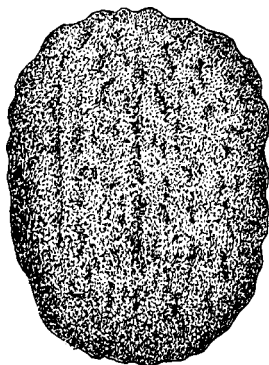
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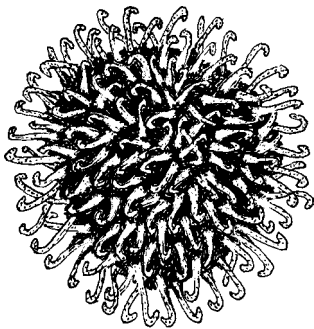
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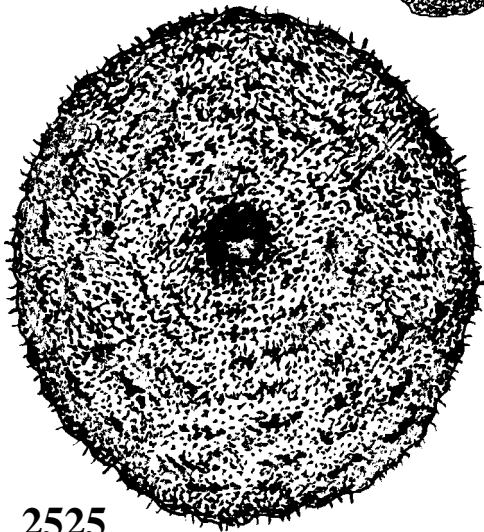
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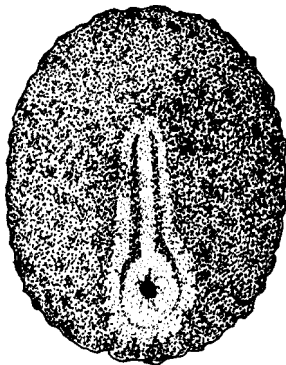
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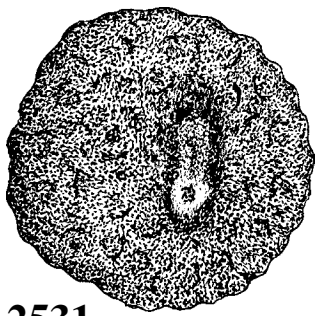
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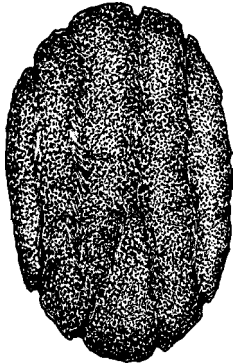
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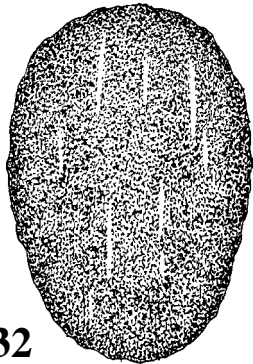
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or slight obovate, dorsal side convex, ventral concave with a deep longitudinal furrow, 1-1.2 x 0.7-0.8 mm. Surface waved, lustreless, dark-brown, with a whitish stripe on convex side.  $2n = 44, 66$ . Native to Eurasia and northern Africa, in fields, vineyards, stony places, sandbanks. Hu, Ro, Sk.

**2533. *Galium parisiense* L.** — Annual, stems 5-30 cm high, procumbent to ascending, somewhat scrambling, retrorsely aculeate rough. **Fruits double achenes, ellipsoidal, dorsal side convex, ventral concave, with oblong furrow and roundish hilum, 0.7-0.9 x 0.5-0.7 mm. Surface with curved hairs, papillose, dull, dark greyish-brown.  $2n = 22$  (44, 66).** Native to southern, western and central Europe, on cultivated fields, at roadsides, in dry, open habitats. Hu, Ro, Sk.

**2534. *Galium polonicum* Blocki, *G. carpaticum* Klovov** — Perennial, stems up to 120 cm high, 4-angled, stout hairy or glabrous. **Fruits double achenes, ellipsoidal or ovoid, dorsal side convex, ventral concave, with oblong furrow, 1.9-2.1 x 1.4-1.6 mm. Surface covered with small, thin, curved whitish hairs, lustreless, dark-brown.  $2n = 44$ .** Native to eastern Europe, in light woods. Pl.

**2535. *Galium pumilum* Murray, *G. sylvestre* Pollich non Scop.** — Perennial, a plant greenish-brown when dry, stems 15-70 cm high, not red at the base, basal internodes very short. **Fruits double achenes, ellipsoidal to globose, dorsal side convex, ventral concave, with oblong furrow and roundish hilum, 1.5-1.7 x 1.2-1.3 mm. Surface obtuse papillose or undulate.  $2n = 88$ .** Native to western and central Europe, in pastures, light woods, scrubs, on overgrown rocks, grasslands. Br, Hu, Pl, Ro, Sk, Uk.

**2536. *Galium rivale* (Sibth. et Sm.) Griseb., *Asperula rivalis* Sibth. et Sm., *A. aparine* M. Bieb.** — Perennial, stems 70-120 cm high, ascending from a slender base, stout. **Fruits double achenes,  $\pm$  ovoid, reniform, ventral side with deep furrow, 1.4-1.6 x 0.9-1 mm. Surface granulate, glabrous or minute, tuberculate.  $2n = 66$ .** Native to Eurasia, in lowland woods, river scrubs, in basic up to slight acid grounds; throughout the Carpathians.

**2537. *Galium rotundifolium* L., *G. scabrum* auct. non L.** — Perennial, stems up to 25-35 cm high, slender, glabrous, rarely with short, scattered hairs. **Fruits double achenes, spherical, dorsal side**

**convex with patent, hooked hairs, ventral concave,  $\pm$  glabrous, with a depression and hilum, 1.5 mm in diam (without hairs). Surface smooth, lustreless, dark-brown.  $2n = 22$ .** Native to Eurasia, in light coniferous woods, on calcareous grounds. Hu, Pl, Ro, Sk, Uk.

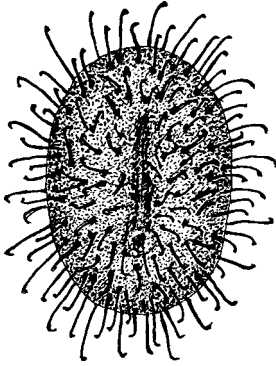
**2538. *Galium rubioides* L., *G. boreale* subsp. *rubioides* (L.) Čelak.** — Perennial, stems 45-100 cm high, erect, stout, weakly 4-angled below, distinctly 4-angled above, glabrous or hairy. **Fruits double achenes, ellipsoidal, dorsal side convex, ventral concave with oblong furrows, 2.2-3 x 2-2.8 mm. Surface smooth, waved, inflated, pale to reddish-brown.  $2n = 44, 66, 132$ .** Native to southern Europe, in moist lowland woods, meadows and on riverbanks. Hu, Mo, Pl, Ro, Sk, Uk.

**2539. *Galium saxatile* L., *G. hircynicum* Weigel** — Perennial, stems 8-40 cm high, ascending, glabrous. **Fruits double achenes, ellipsoidal or obovoidal, dorsal side convex, ventral concave, with large depression, mostly in the lower and hilum half, 1.3-1.6 x 1-1.2 mm. Surface acute papillose, lustreless, dark to blackish-brown.  $2n = 22, 44$ .** Native to Europe, on rocks, screes, alpine meadows and pastures. Pl, Sk.

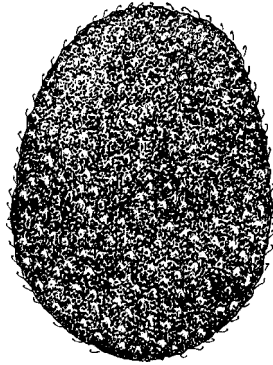
**2540. *Galium schultesii* Vest., *G. intermedium* Schult.** — Perennial, stems 30-120 cm high, stout, remote, subterete at the base, with 4 weak ridges, otherwise 4-angled, glabrous. **Fruits double achenes,  $\pm$  globose to slight ellipsoidal, dorsal side convex, ventral concave, with deep depression, 1.3-1.7 x 1.1-1.5 mm. Surface slight waved,  $\pm$  pruinose when fresh, faint lustrous, dark to blackish-brown.  $2n = 66$ .** Native to Europe, in light, leafy woods with neutral up to calcite grounds. Hu, Mo, Pl, Ro, Sk.

**2541. *Galium spurium* L., *G. agreste* Wallr.** — Annual, stems 40-150 cm high, scrambling weak to rather stout, retrorsely aculeate, usually hairy at the nodules. **Fruits double achenes,  $\pm$  globose, reniform, dorsal side convex, ventral concave with deep depression in the middle, 1.7-1.9 x 1.5-1.7 mm. Surface dense setose or glabrous, lustreless, grey to greyish-brown.  $2n = 20$  (44).** Native to Eurasia, in flax-fields. Hu, Mo, Pl, Ro, Sk, Uk.

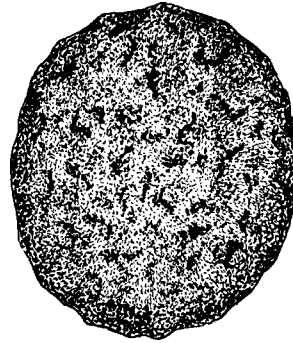
**2542. *Galium sylvaticum* L.** — Perennial, stems 80-140 cm high, stout, bushy, terete, often with faint ridges above, glabrous. **Fruits double achenes,  $\pm$**



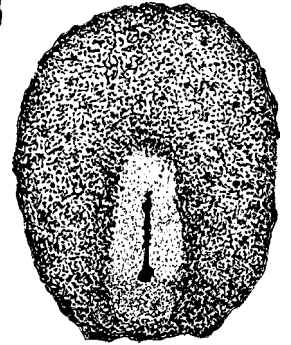
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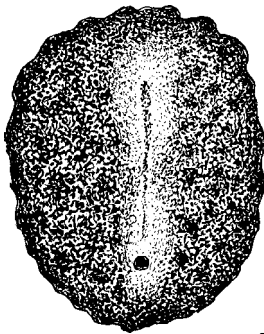
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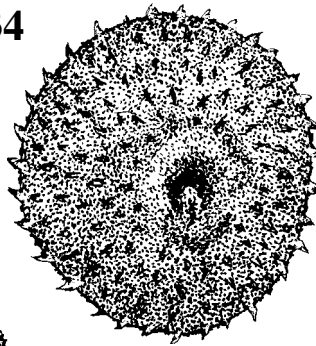
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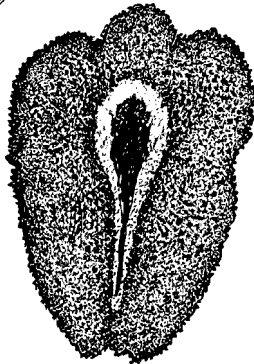
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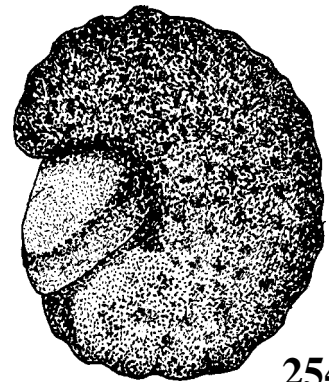
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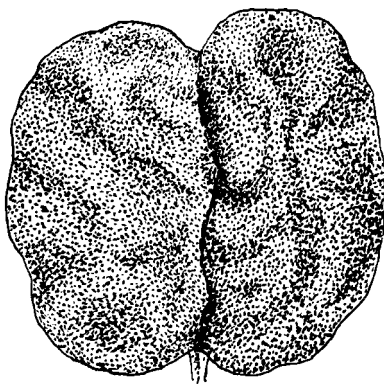
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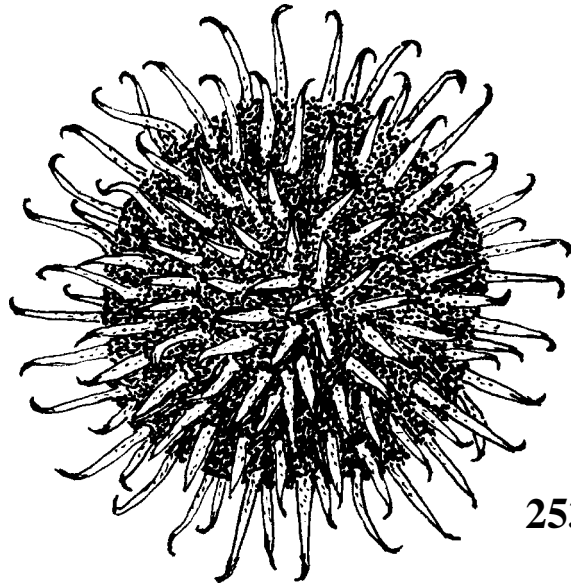
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globose or slight ellipsoidal, dorsal side convex, ventral  $\pm$  flat, with deep depression, 1.3-1.5 x 1.1-1.3 mm. Surface  $\pm$  pruinose when young, waved, reticulate-areolate, lustreless, dark-brown. **2n = 22.** Native to Europe, in light leafy woods and shrubberies. Hu, Pl, Ro, Sk.

**2543. *Galium tricornutum*** Dandy, *G. tricornu* auct. non Stokes — Annual, stems 20-60 cm high, scrambling, stout, retrorsely aculeate, without straight hairs below and above the nodules. **Fruits double achenes,  $\pm$  globose, biconvex, with depression and hilum on ventral side, 3-3.6 x 2.9-3.3 mm. Surface with numerous acute papillae, lustreless, pale-brown. 2n = 44.** Native to Europe, in fields, fallows, waste places, disturbed grounds. Hu, Mo, Pl, Ro, Sk, Uk.

**2544. *Galium trifidum*** L., *G. ruprechtii* Pobed. — Perennial, stems 10-40 cm high, delicate, laxly caespitose, retrorsely aculeate on the obscure angles, internodes long. **Fruits double achenes,  $\pm$  globose, biconvex with depression and hilum on the ventral side, 1.1-1.3 mm in diam. Surface  $\pm$  smooth, dull, grey. 2n = 24.** Native to Europe, in bogs and other wet places. Pl, Uk.

**2545. *Galium uliginosum*** L. — Perennial, stems 10-100 cm high, slender, procumbent to ascending, glabrous, rough on angles. **Fruits double achenes,  $\pm$  ovoid or ellipsoid (reniform from lateral side), ventral side with oblong furrow and roundish hilum, 1.2-1.5 x 0.8-0.9 mm. Surface granulate, glabrous, dull, dark or reddish-brown. 2n = 22, 44, 66.** Native to Euro-Siberia, in wet meadows, marshes, fens and other wet habitats; in all Carpathian regions.

**2546. *Galium valdepilosum*** H. Braun — Perennial,  $\pm$  caespitose, with few non-flowering shoots, stems 9-40 cm, ascending to erect, with patent hairs, reddish at the base. **Fruits double achenes, spherical, planoconvex, 1.1-1.5 x 1.1-1.3 mm. Surface obtuse to acute papillose, lustreless, dark-brown. 2n = 22, 44.** Native to eastern Europe, in drying soils, pastures, light forests and at forest margins, in shrubberies. Pl, Uk.

**2547. *Galium verrucosum*** Huds., *G. valantia* Weber — Annual, stems 5-50 cm, erect to ascending, retrorsely aculeate and scabrid. **Fruits double achenes,  $\pm$  ellipsoid or obovoid, biconvex with a small flat area on ventral side and drab hilum in the middle, 5-6 x 2.7-3 mm. Surface prominent verrucose, lustreless, pale-brown. 2n = 22.** Native to

southern and naturalized in central Europe, in cereal fields and other open habitats. Pl, Sk.

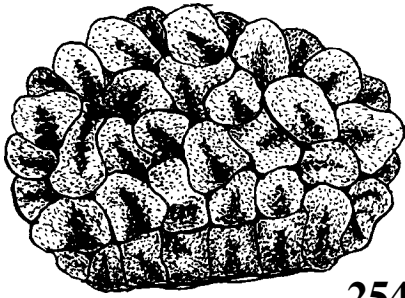
**2548. *Galium verum*** L. — Perennial, stems 20-120 cm high,  $\pm$  terete, with 4 raised lines, rarely glabrescent. **Fruits double achenes, reniform, dorsal side convex, ventral concave, with indistinct oblong furrow and roundish hilum, 1-1.3 x 0.8-0.9 mm. Surface reticulate-areolate, lustrous, dark-brown. 2n = 44.** Native to Eurasia, on grasslands, steppe slopes, light woodlands and boundaries; throughout the Carpathians.

**2549. *Cruciata glabra*** (L.) Ehrend., *Galium vernum* Scop., *Valantia glabra* L. — Perennial, stems ascending or erect, 5-30 cm high, unbranched, 4-angular, bare or weakly pubescent below. **Fruits double achenes,  $\pm$  globular, concavo-convex, 1.1-1.3 x 0.9-1.1 mm. Surface waved, dull, dark-brown. 2n = 22, 44.** Native to southern Europe, in light and shrubby woods, meadows with moist basic or neutral soils. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**2550. *Cruciata laevipes*** Opiz, *Galium cruciata* (L.) Scop. — Perennial, stems 20-60 cm high, slender, with patent hairs. **Fruits double achenes, with 1-2 mericarps, globose to slight ovoid, 2.4-2.8 mm in diam. Surface wrinkly, granular or reticulate-areolate, glabrous, lustrous, dark-brown. 2n = 22.** Native to Eurasia, in light scrubs, boundaries, ditches, pastures and lowland forests. Mo, Pl, Ro, Sk, Uk.

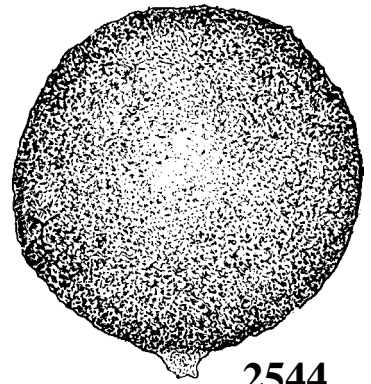
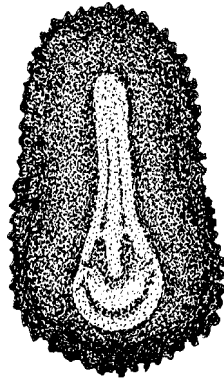
**2551. *Cruciata pedemontana*** (Bellardi) Ehrend., *Galium pedemontanum* (Bellardi) All. — Annual, stems 10-35 cm high, simple or branched from the base, rough, with patent hairs and recurved prickles. **Fruits double achenes, with 1 or 2 mericarps, reniform or globular, dorsal side convex, ventral flat or concave, with deep depression and roundish hilum, 1-1.2 x 0.9-1.1 mm. Surface glabrous, lustreless, dark-brown, with whitish oblong spots. 2n = 18, 22.** Native to Eurasia, on rocky steppes, sandbanks and grasslands. Mo, Ro, Sk, Uk.

**2552. *Crucianella angustifolia*** L., *C. oxyloba* Janka — Annual, stems ascending, 2- or 4-angular. **Fruits double achenes, with 2 mericarps, oblong ellipsoid or obovoid, dorsal side convex, ventral concave, with broad longitudinal furrow, 2.1-2.4 x 0.9-1.1 mm. Surface glabrous, lustreless, dark-brown, with oblong whitish spots. 2n = 22.** Native to the Mediterranean, in light woods, hay-meadows, shrubberies, stony habitats. Ro.

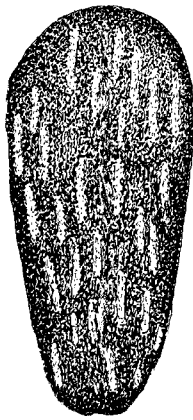


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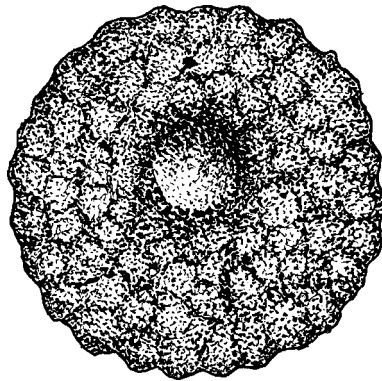
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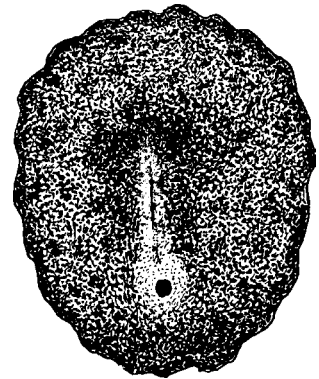
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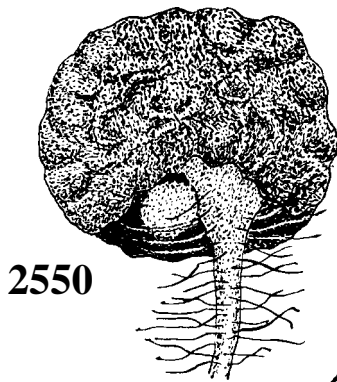
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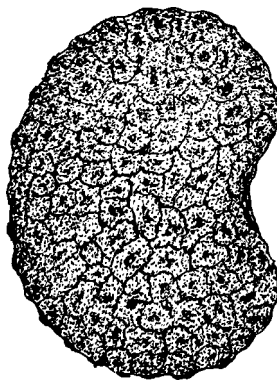
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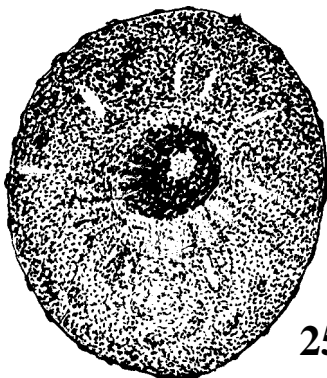
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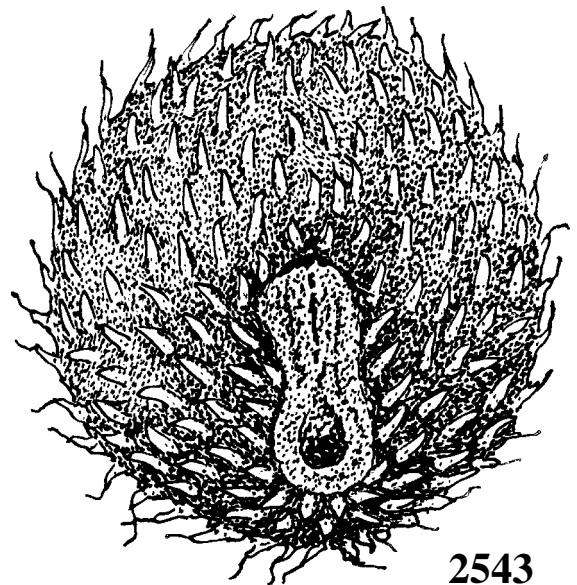
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**2553. *Rubia tinctorum* L.** — Perennial, stems up to 100 cm high, climbing or erect, wingly 4-angular prickled at edges, rough, leaves in whorls of 4-6 mm. **Mericarps reticulate-areolate, 2.6-4.2 mm in diam.  $2n = 22, 44$ .** Native to western and central Asia; in the Carpathians formerly cultivated for dye extracted from its roots, up to now naturalized in some places, in hedges, thickets and waste places. Cz, Hu, Ro, Sk, Uk.

## 120. CAPRIFOLIACEAE

**2554. *Sambucus ebulus* L., *S. humilis* Mill.** — Perennial, up to 2 m high, stems stout, erect, usually simple, corolla white, rarely pink outside. **Stones obovoid, dorsal side convex, ventral rooflike, apex slight roundish, bottom gradually narrowed, with small hilum, 3.2-3.6 x 1.6-1.8 mm. Surface transversal furrowed, smooth, pinkish.  $2n = 36$ .** Native to Eurasia, on forest clearings, cut-over areas, village communities, scrubs, vineyards; formerly cultivated as a medicinal plant; naturalized in all Carpathian regions.

**2555. *Sambucus nigra* L., *S. vulgaris* Lam.** — Shrub or a small tree, up to 10 cm high, with brownish-grey, sulcate, corky bark and whitish pith, branches often arching. **Stones ellipsoidal, dorsal side convex, ventral rooflike, apex truncate, bottom gradually narrowed with hilum, 3.5-4.1 x 1.8-2.2 mm. Surface transversal furrowed, pale-brown.  $2n = 36$ .** Native to Eurasia, in leafy woods and scrubs, lowland forests, boundaries, fields, fallows, hedges and fens; throughout the Carpathians.

**2556. *Sambucus racemosa* L., *S. sylvestris* Bubani** — Shrub, up to 4 m high, stems often arching, bark grey, pith reddish-brown. **Stones ellipsoidal or obovoid, dorsal side convex, ventral rooflike, apex semiroundish, bottom gradually narrowed with hilum, 3-3.4 x 1.7-1.9 mm. Surface transversal interruptive furrowed, faint lustrous, pinkish-brown.  $2n = 36$ .** Native to Eurasia and North America, in woods, scrubs, overgrown rocks, cut-over areas, in mountain and subalpine zones; in all Carpathian regions.

**2557. *Sambucus sieboldiana* Graebn.** — Shrub or a small tree, up to 6 m high. **Stones ellipsoidal or oblong-obovoidal, dorsal side convex, ventral rooflike, bottom gradually narrowed, with roundish hilum, 3.2-3.6 x 1.6-1.8 mm. Surface**

**transversal furrowed, faint lustrous, yellowish-brown.** Native to Japan, China, rarely cultivated for ornament in parks.

**2558. *Viburnum carlesii* Hemsl.** — Shrub, up to 1.5 m high, deciduous, flowers whitish-rose, aromatic. **Stones ovoid, dorsal side convex with two shallow furrows, ventral side also convex with three shallow furrows and hilum on the acuminate central part, 8-9 x 5.4-5.8 mm. Surface fine waved, lustreless, dirty pale-brown.** Native to Korea, often cultivated in parks as a very nice ornamental.

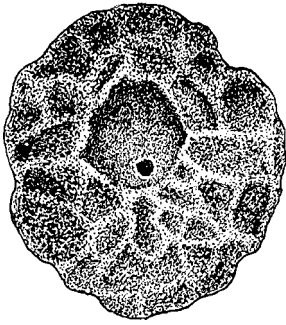
**2559. *Viburnum farrerii* Stearn, *V. fragrans* Bunge non Loisel.** — Perennial, up to 3 m high, with brown, lustrous twigs, flowering in early spring (March, April). **Stones oblong ellipsoid or slight obovoid, dorsal side convex, ventral with deep longitudinal furrow, slung at the apex, 7.5-9 x 3.5-4 mm. Surface shallow pitted, lustreless, pale-greyish or pinkish-brown.** Native to northern China; in the Carpathians rarely planted as an ornamental in parks.

**2560. *Viburnum lantana* L.** — Deciduous shrubs, up to 6 m high, twigs with dense, greyish, stellate pubescent, terete, buds naked. **Stones broad ellipsoid, dorsal side with 2 furrows, ventral the same, but with longitudinal rib in the middle part, 5.5-6.5 x 4-5 mm. Surface waved, lustreless, reddish-brown.  $2n = 18$ .** Native to Europe and western Asia, widely growing in nature of the Carpathians, also planted for ornament in parks.

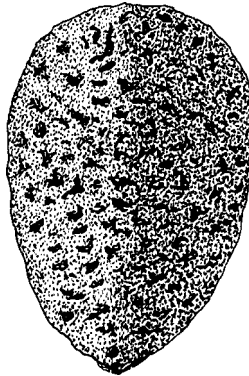
**2561. *Viburnum opulus* L., *Opulus glandulosus* Moench, *V. lobatum* Lam.** — Deciduous shrubs, up to 5 m high, twigs greyish, glabrous, angled, buds with scales. **Stones  $\pm$  roundish, lateral strong compressed, ventral side with longitudinal rib and hilum, 7-8.5 x 6-7 mm. Surface fine waved, lustreless, reddish-brown.  $2n = 18$ .** Native to Eurasia, in leafy and lowland woods, coastal scrubs; in all Carpathian territories.

**2562. *Viburnum rhytidophyllum* Hemsl.** — Shrub, up to 3 m high, young twigs stellate-hairy, evergreen. **Stones oblong ellipsoid, lateral strong flattish, dorsal side with 2, ventral with 3 broad furrows, 5.2-6 x 3.2-3.8 mm. Surface waved, pale-brown, furrows dark- to blackish-brown.  $2n = 18$ .** Native to China; in the Carpathians rarely planted for ornament in parks.

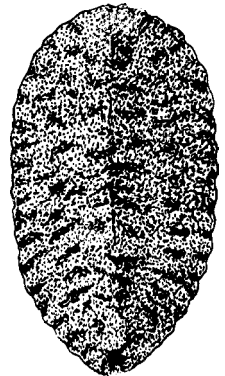




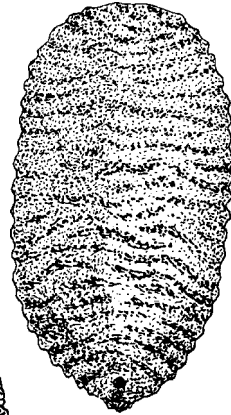
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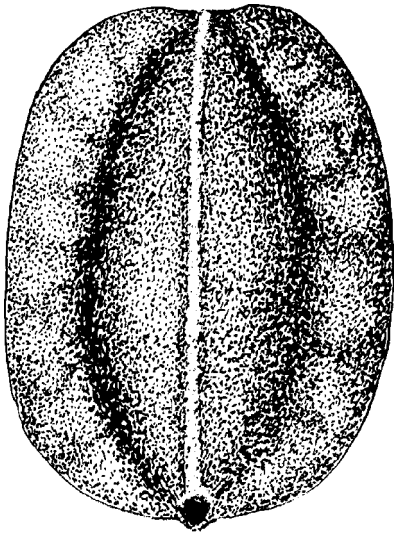
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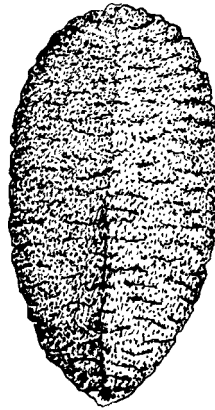
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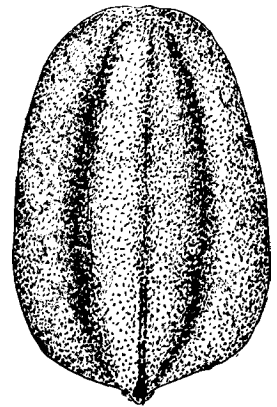
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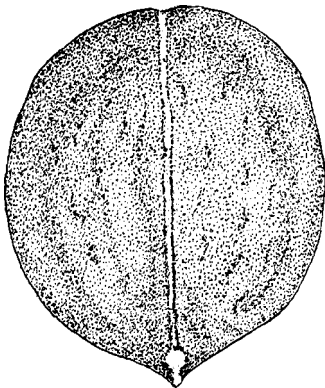
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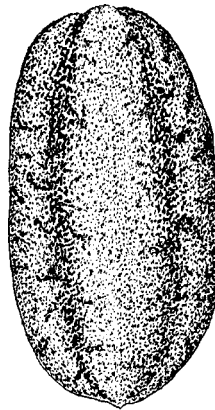
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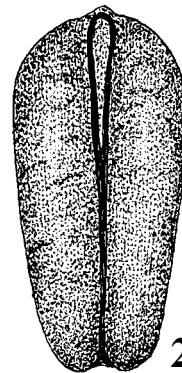
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**2563. *Viburnum sieboldii* Miq.** — Perennial, up to 3 m high, leaves 7-10 cm long and wide, flowers cream coloured, flowering in May and June. **Stones obovoid, lateral slight compressed, ventral side with longitudinal furrow, 7.5-8 x 4.2-4.5 mm. Surface irregular spotted, lustreless, pale-brown, spots dark-brown.** Native to Japan; in the Carpathians cultivated only rarely, as an ornamental in parks.

**2564. *Viburnum tinus* L.** — Evergreen shrubs, up to 7 m high, twigs glabrous or sparsely pubescent, weakly angled, corolla pinkish outside, white inside. **Stones ellipsoidal or subglobose, narrowed at the apex into necklet, 5-ribbed, 7-7.7 x 5-5.5 mm. Surface glabrous lustreless, pinkish-brown.** Native to southern Europe; in the Carpathians only rarely cultivated as an ornamental in parks and gardens. Uk.

**2565. *Kolkwitzia amabilis* Graebn.** — Shrub, up to 2 m high, leaves deciduous, flowers of salmon colour. **Fruits achenes with one or two ellipsoidal seeds interconnect with long beak, rich, bristly, with joined leaflets, 7-8 x 2-2.4 mm. Surface dark-brown.** Native to high mountains of central China; in the Carpathians very rarely planted as an interesting shrub.

**2566. *Symphoricarpos albus* (L.) S. F. Blake, *S. racemosus* Michx.** — Shrub, up to 1-3 m high, stems erect, slender, twigs yellowish-brown, glabrous, strong branched. **Stones ellipsoidal, lateral compressed, dorsal side slight convex, lateral flat, small hilum at the bottom, 4.3-4.7 x 2.8-3.2 mm. Surface glabrous, lustreless, whitish. 2n = 36, c. 54, 72.** Native to North America; in the Carpathians commonly planted for ornament in parks, gardens and town verdure, often naturalized.

**2567. *Symphoricarpos orbiculatus* Moench, *S. vulgaris* Michx.** — Shrub, up to 1-1.5 m high, young twigs tomentose, leaves elliptical up to ovoid, flowers yellowish-white, pinkish outside. **Stones ellipsoidal, dorsal side slight convex, ventral flat, hilum small, roundish, 2.2-3 x 1.8-2.2 mm. Surface glabrous, faint lustrous, straw to pale-brown. 2n = 18.** Native to North America; in the Carpathians rarely cultivated for ornament in parks and town verdure.

**2568. *Linnaea borealis* L., *L. serpyllifolia* Rydb.** — Small, creeping shrublet, with ascending stems, leafy below, leafless above, usually with 2 pinkish-white flowers on the top. **Fruits achenes, obovoid, enfold by persistent bracteoles, with many glandular and**

**eglandular hairs, 3.3-3.7 x 1.9-2.2 mm. 2n = 32.** Native to circumpolar territories, peatbogs, peatery pinewoods and dwarf pine slopes, in poor acid grounds. Br, Pl, Ro, Sk, Uk.

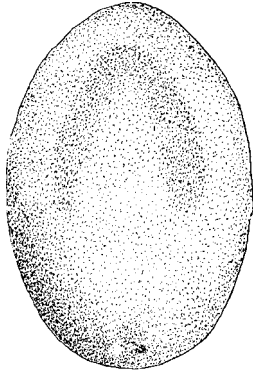
**2569. *Lonicera alpigena* L., *Caprifolium alpinum* Lam.** — Shrub, up to 3 m high, usually glabrous, twigs with a solid pith, flowers yellowish or greenish-yellow. **Seeds pyrenes, broad or ellipsoidal, apex blunt acute, bottom truncate, dorsal and ventral sides with 2 longitudinal furrows, hilum oval, 5-6 x 4-4.5 mm. Surface glabrous, lustrous, reddish-white. 2n = 18, 36.** Native to the mountains of southern and central Europe, usually calcicole. Ro, Sk.

**2570. *Lonicera caerulea* L.** — Shrub, up to 2 m high, glabrous or  $\pm$  hairy, twigs with a solid pith, bark yellowish-brown to reddish, flaky. **Seeds pyrenes, ovoid, apex blunt rounded, bottom  $\pm$  truncate, with small oval hilum, 2.1-2.5 x 1.5-1.7 mm. Surface fine, low-tuberculate, lustreless, reddish-brown. 2n = 18.** Native to Eurasia, in moister coniferous and mountain woods and scrubs, dwarf pine sites, peatbogs, poor, acid grounds. Mo, Ro, Uk

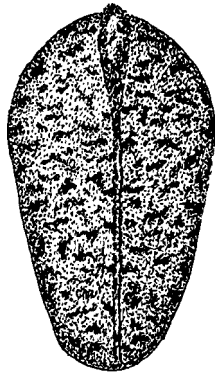
**2571. *Lonicera caprifolium* L., *Caprifolium vulgare* Medik.** — Trailing shrub, up to 4 m high, twigs and leaves subglabrous, flowers white or yellowish. **Seeds pyrenes, ellipsoid or obovoid, lateral compressed, apex roundish, bottom gradually narrowed, lateral sides round furrowed, 4.7-5.3 x 3.3-3.9 mm. Surface fine waved, lustrous, orange-brown. 2n = 18.** Native to Eurasia, mainly in mountains, in shrubby slopes, woody steppes, rarely planted in parks. Hu, Mo, Pl, Ro, Sk, Uk.

**2572. *Lonicera chrysantha* Turcz.** — Shrub, up to 4 m high, corolla yellowish-white. **Seeds pyrenes, elliptic, lateral flattish, 4.7-5.3 x 3.3-3.9 mm. Surface waved, slight lustrous, reddish-brown.** Native to northeastern Asia and Japan; in the Carpathians rarely cultivated for ornament in parks.

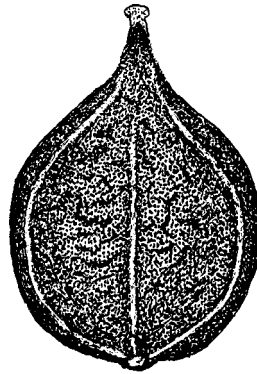
**2573. *Lonicera edulis* Turcz.** — Shrub, up to 1-1.5 m high, bark of old twigs brown or yellowish-brown, pared off in narrow tapes. **Seeds pyrenes, ellipsoidal, lateral compressed, 2-2.2 x 1.5-1.6 mm. Surface waved, slight lustrous, pale-brown or dark-violet.** Native to northeastern grounds; in the Carpathians recently experimentally cultivated in gardens as a potential food-stuff. (Sk.).



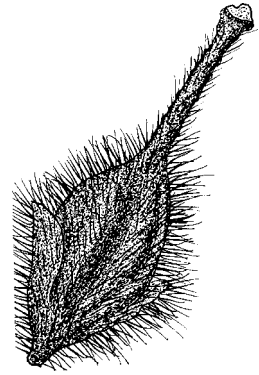
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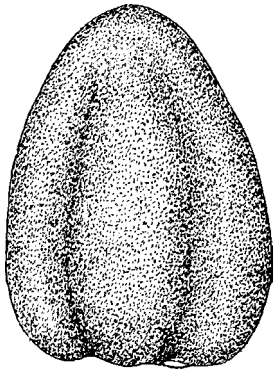
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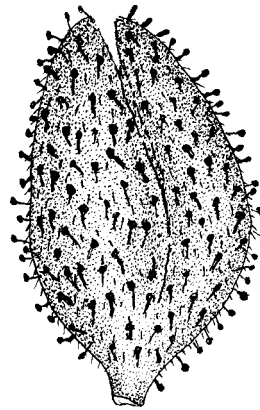
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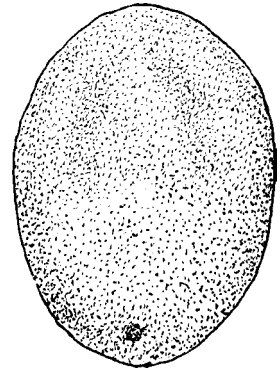
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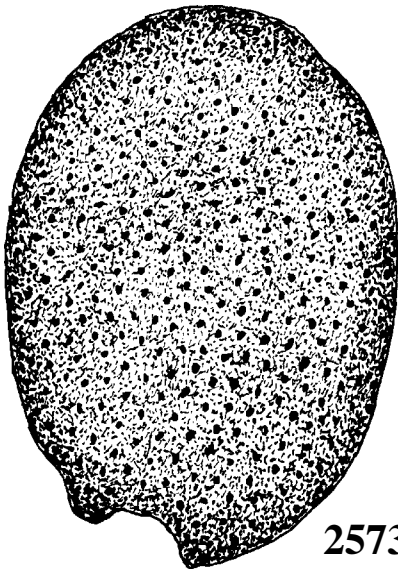
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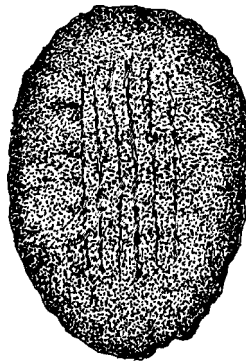
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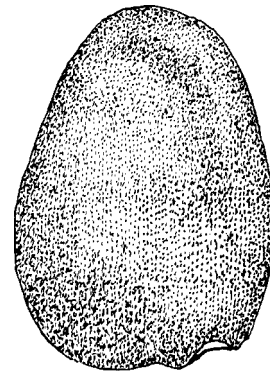
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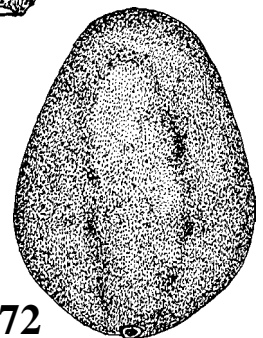
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**2574. *Lonicera ferdinandi*** Franch. — Shrub, up to 3 m high, erect, fruits light-red strawberries. **Seeds pyrenes,  $\pm$  roundish or slight ellipsoidal, lateral compressed, 3.5-3.9 x 2.8-3.2 mm. Surface longitudinal waved, faint lustrous, reddish-brown.** Native to China; in the Carpathians very rarely planted in parks and town verdure, as a decorative species with leaves and fruits, especially in southern areas.

**2575. *Lonicera fragrantissima*** Lind. ex Paxt., *L. odoratissima* hort. — Shrub, up to 2-3 m high, strong ramified, flowers white. **Seeds pyrenes, oval, lateral compressed, apex and bottom roundish, 3-3.6 x 2.2-2.5 mm. Surface fine waved, lustrous, yellowish-brown.** Native to eastern China; in the Carpathians rarely cultivated as an ornamental in parks and town verdure.

**2576. *Lonicera implexa*** Aiton — Perennial, evergreen, much branched, twigs glabrous, glaucous, flowers yellowish. **Seeds pyrenes, ovoid, lateral compressed, indistinct roundly furrowed, 3.9-4.3 x 3.2-3.4 mm. Surface waved, lustrous, yellowish or yellowish-brown.** Native to the Mediterranean region, rarely planted for ornament in parks, gardens and town verdure.

**2577. *Lonicera involucrata*** (Richards) Banks ex Spreng. — Shrub, up to 3 m high, twigs erect, glabrous, leaves oblong ovoid, downy beneath. **Seeds pyrenes, ellipsoid, lateral compressed, indistinct roundly furrowed, 3-3.5 x 1.9-2.3 mm. Surface waved, lustrous, chocolate-brown.** Native to the mountains of North America; in the Carpathians rarely cultivated as an ornamental in parks and gardens.

**2578. *Lonicera japonica*** Thunb. — Semi-evergreen, twigs hirsute, trailing, creeping to ascending, leaves ovate to oblong-ovate, acute, flowers white, tinged with purple. **Seeds pyrenes, ovoid, ellipsoid, lateral compressed, distinct roundly furrowed, 3-3.4 x 2-2.3 mm. Surface waved, glossy, chocolate-brown.  $2n = 18$ .** Native to eastern Asia; in the Carpathians cultivated for ornament and locally naturalized.

**2579. *Lonicera kamtschatica*** (Sevast.) Pojark. — Shrub, up to 2-2.5 m high, with a dense corona, fruits obelliptical black strawberries. **Seeds pyrenes, ovoid, lateral compressed, narrow indistinct winged, 2.1-2.3 x 1.4-1.6 mm. Surface waved, slight lustrous, dark-violet.** Native to eastern Siberia and the Far East, in some places used as food-stuff; in the Carpathians experimentally planted in gardens (Sk.)

**2580. *Lonicera korolkowii*** Stapf, *L. floribunda* Zab. — Shrub, up to 4 m high, twigs hollow, young twigs downy, leaves ovoid to ellipsoidal, flowers pinkish. **Seeds pyrenes, ellipsoid, lateral compressed with distinct, narrow radicle, 3.1-3.5 x 2.3-2.6 mm. Surface waved, slight lustrous, reddish-brown.** Native to Asia Minor; in the Carpathians rarely planted as an ornamental in parks.

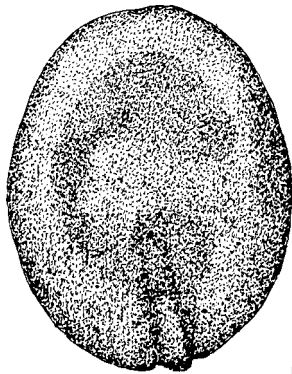
**2581. *Lonicera maackii*** (Rupr.) Maxim. — Shrub, up to 5 m high, with bare light-grey twigs, flowers white, aromatic, fruits globular, dark-red. **Seeds pyrenes, ellipsoid, lateral compressed, apex rounded, bottom narrowed into hilum, 3-3.4 x 1.9-2.1 mm. Surface waved, dull, reddish-brown.** Native to northern Asia, in leafy forests, on riverbanks and mountain slopes; in the Carpathians rarely cultivated in parks as an ornamental.

**2582. *Lonicera nigra*** L., *L. carpatica* Kit. — Shrub, up to 1-2 m high, twigs erect, greyish-brown, glabrous or downy, full, flowers pale-rose. **Seeds pyrenes, obovoid, lateral flattish, apex  $\pm$  truncate, bottom gradually narrowed with hilum, 2.8-3.2 x 1.8-2 mm. Surface waved, slight lustrous, pale-brown.  $2n = 18$ .** Native to the mountains of southern and central Europe, in mixed woods, dwarf pine slopes, slight acid grounds. Pl, Ro, Sk, Uk.

**2583. *Lonicera nitida*** E. H. Wilson — Shrub, up to 2 m high, erect, young twigs densely hirsute, leaves evergreen, broadly ovoid, cordate at base. **Seeds pyrenes, obovoid, sometimes one part of the surface flat, dorsal side convex, ventral rooflike, 2.5-2.9 x 1.8-2 mm. Surface fine waved, lustrous, brown.** Native to western China; in the Carpathians often cultivated in parks and town verdure, in many cvs.

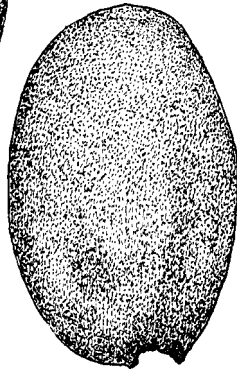
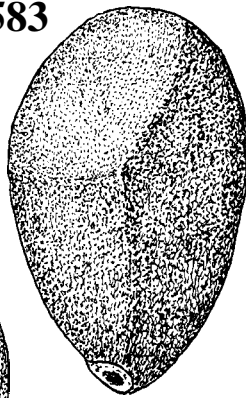
**2584. *Lonicera periclymenum*** L., *Periclymenum vulgare* Mill. — Shrub, trailing, up to 5 m high, glabrous or pubescent, deciduous, flowers yellowish-white. **Seeds pyrenes, obovoid, lateral compressed, distinct roundly furrowed, 3.7-4.3 x 2.7-3 mm. Surface waved, slight lustrous, orange-brown.  $2n = 18, 36$ .** Native to western Europe; in the Carpathians rarely cultivated in parks, uniquely escaping into wood margins and lowland woods. Hu, Pl, Mo, Ro, Sk.

**2585. *Lonicera pileata*** Oliv. — Shrub, up to 1 m high, twigs ramified, flowers white. **Seeds pyrenes,**

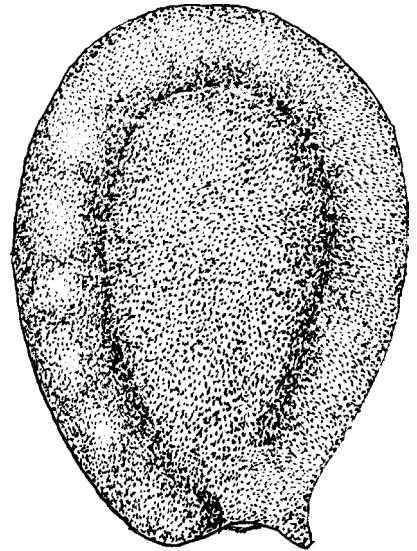


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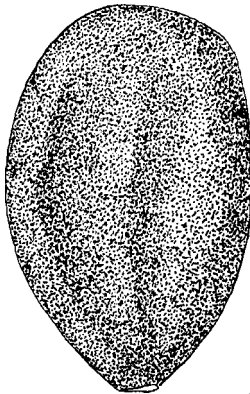
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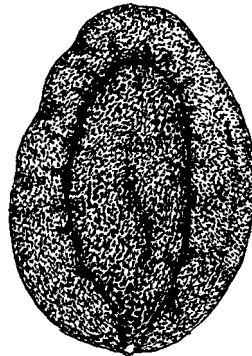
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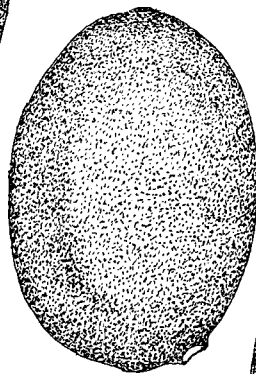
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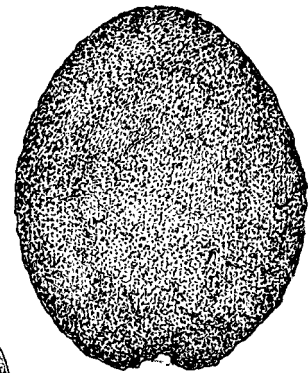
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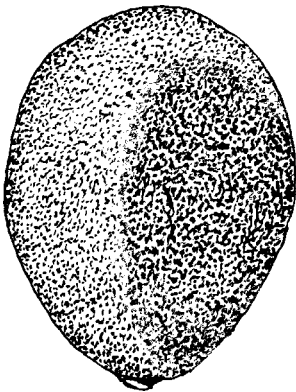
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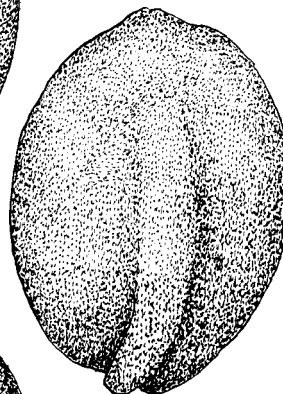
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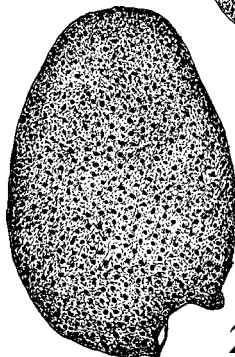
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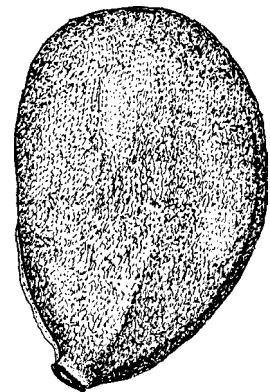
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obovoid, lateral slight compressed, most of dorsal side convex, ventral rooflike or lateral flattish, 2-2.4 x 1.6-1.8 mm. Surface very fine waved or smooth, lustrous, olive. Native to China; in the Carpathians commonly cultivated as an ornamental in town verdure.

**2586. *Lonicera tatarica* L., *Caprifolium tataricum* (L.) Kuntze** — Shrub, up to 3 m high, twigs glabrous, grey, hollow, leaves ovoid to ovoid-ellipsoidal, flowers white to red. **Seeds pyrenes, obovoid, lateral flattish, hem rougher than the middle area, 2.8-3.3 x 2.1-2.4 mm. Surface waved, slight lustrous, purplish.  $2n = 18$ .** Native to Eurasia; the most frequently cultivated species in gardening, planted in some cvs, in all Carpathian region.

**2587. *Lonicera xylosteum* L., *Caprifolium xylosteum* (L.) Gaertn.** — Shrub, up to 3 m high, young twigs greyish downy, pith hollow, leaves broadly elliptic-ovate, acute or subacute, flowers yellowish-white. **Seeds pyrenes,  $\pm$  roundish, lateral flattish, radicle longer than the cotyledons, margin rougher than the rest of the area, 2.8-3.2 x 2.2-2.4 mm. Surface waved, slight lustrous, purplish.  $2n = 18$ .** Native to Eurasia, in dry and light woods and on shrubby slopes. Br, Hu, Mo, Pl, Sk, Uk.

**2588. *Lonicera x purpusii* Rehder** — Shrub, 2-3 m high, with twigs crooked down to the earth, leaves evergreen, broadly ovoid or lanceolate, 5-10 cm long. **Seeds pyrenes, ellipsoid, lateral slight compressed, apex roundish, bottom narrowed, with large hilum, 2-2.4 x 1.3-1.5 mm. Surface waved, faint lustrous, pale- or dark-brown.** Species of hybrid origin (*Lonicera fragrantissima* x *standishii*); in the Carpathians rarely cultivated in parks and town verdure.

**2589. *Diervilla lonicera* Mill., *D. canadensis* Willd., *D. trifida* Moench** — Shrub, up to 1.5 m high, twigs and leaves hairless, flowers yellow. **Seeds pyrenes, mostly ellipsoidal, slight compressed, 0.9-1.1 x 0.8-0.9 mm. Surface reticulate-foveolate, slight lustrous, brown.  $2n = 18$ .** Native to North America; in the Carpathians often cultivated in parks, uniquely naturalized.

**2590. *Diervilla rivularis* Gatt.** — Shrub, up to 2 m high. **Seeds pyrenes, ovoid, lateral compressed, 1-1.1 x 0.7-0.8 mm. Surface reticulate-foveolate,**

**slight lustrous, pale-brown.** Native to North America; in the Carpathians rarely cultivated for ornament in parks.

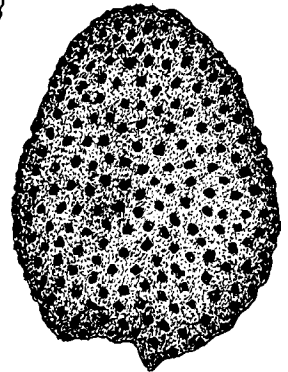
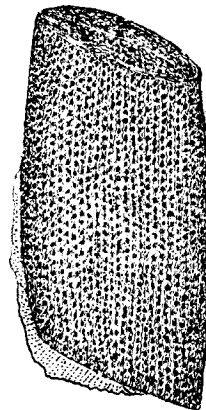
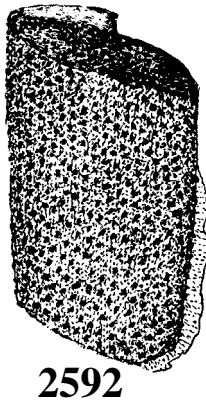
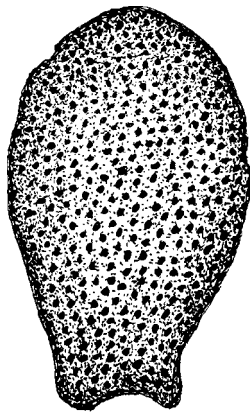
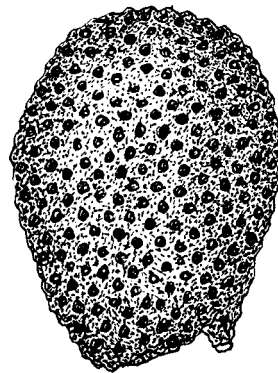
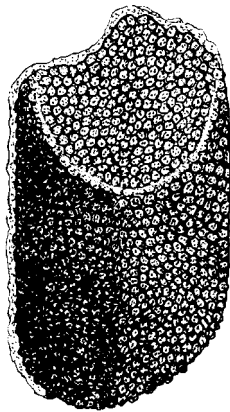
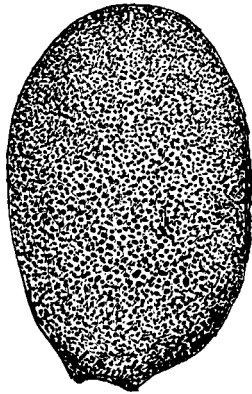
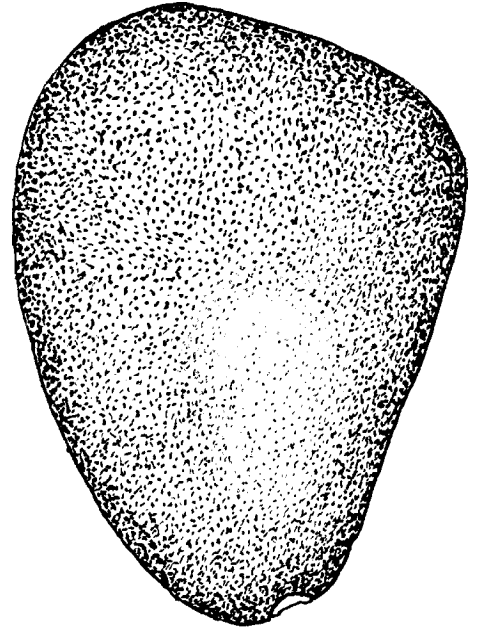
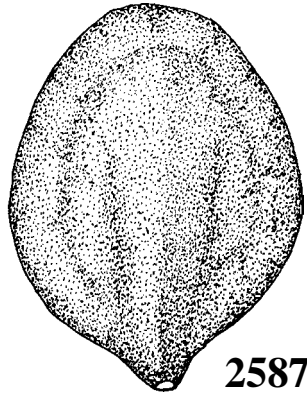
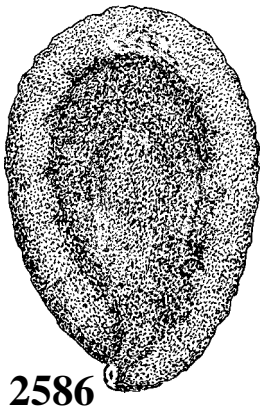
**2591. *Diervilla sessilifolia* Bucki** — Shrub, up to 1-1.5 m high, erect, with 4-angular twigs and deciduous leaves, corolla yellow. **Seeds pyrenes,  $\pm$  obovoid, lateral compressed, 0.9-1.1 x 0.6-0.7 mm. Surface reticulate-foveate, slight lustrous, pale-brown.** Native to North America, rarely cultivated as an ornamental shrub in parks.

**2592. *Weigela floribunda* (Sieb. et Zucc.) DC., *Diervilla multiflora* Lam.** — Shrub, up to 3 m high, twigs tomentose or hairy in 2 rows, leaves ellipsoidal, flowers mostly dark-red. **Seeds mostly cylindric or semicylindric, slanting at the apex and bottom, winged to some extent, 1.3-1.5 x 0.7-0.8 mm. Surface reticulate-foveolate, faint lustrous, pale-brown.  $2n = 72$ .** Native to Japan; in the Carpathians rarely planted as an ornamental in parks.

**2593. *Weigela florida* (Bunge) DC., *W. rosea* Lind., *Diervilla florida* (Bunge) Siebold et Zucc.** — Shrub, up to 3 m high, twigs hairy in 2 rows, leaves elliptic, flowers deep-rose. **Seeds mostly semicylindric, slanting at the apex and bottom, 1.5-1.7 x 0.8-0.9 mm. Surface waved, faint lustrous, pale-brown.  $2n = 36, 72$ .** Native to eastern Asia; in the Carpathians cultivated in parks and gardens, uniquely escaping.

**2594. *Weigela praecox* (Lemoine) Bailey, *Diervilla praecox* Lemoine** — Shrub, up to 2 m high, flowering in May, corolla pink or purple-rose. **Seeds mostly cylindric, slanting at the apex and bottom, winged to some extent, 1.5-1.7 x 0.8-0.9 mm. Surface reticulate-foveolate, slight lustrous, pale-brown.** Native to eastern Asia; in the Carpathians rarely planted in parks, the earliest flowering species.

**2595. *Leycesteria formosa* Wall.** — Shrub, stems up to 2 m high, glabrous, hollow and pruinose when young, leaves deciduous. **Seeds  $\pm$  obovoid or ellipsoid, narrow oblong in outline, lateral compressed, apex  $\pm$  rounded or truncate, bottom mostly narrowed with hilum, 1.1-1.2 x 0.8-0.9 mm. Surface glabrous, glossy, pale-brown.  $2n = 12$ .** Native to India and China; in the Carpathians very rarely cultivated in parks, only in warmer areas.



## 121. ADOXACEAE

**2596. *Adoxa moschatellina* L.** — Perennial, glabrous plant with an erect flowering stem, 5-10 cm high, inflorescence capitate, with one terminal and four lateral flowers. **Seeds pyrenes, ellipsoid or obovoid, with a broad wing around the whole seed, lateral strong compressed, 2.4-2.8 x 1.7-2 mm. Surface fine waved, lustreless, yellowish-brown. 2n = 18.** Native to Eurasia and North America; in the Carpathians often cultivated in parks and gardens, uniquely escaping and naturalized. Au, Hu, Mo, Pl, Ro, Sk, Uk.

## 122. VALERIANACEAE

**2597. *Valeriana collina* Wallr., *V. angustifolia* Tausch non Mill., *V. wallrothii* Kreyer** — Perennial plant without stolons or with hypogeal stolons. Stems 30-70 cm high, densely patent-hairy below, with 4-7 pairs of leaves. **Fruits achenes, oblong-ovoid, lateral compressed, apex gradually narrowed ending with crest, truncate, with hairy bristles, bottom rounded, 3-3.4 x 1.4-1.6 mm (without crest). Surface with 5 ribs above and 1 beneath, glabrous, dull, reddish-brown. 2n = 28.** Native to Europe, on steppy and stony slopes, in light woods with moist, calcareous stands. Mo, Sk, Uk.

**2598. *Valeriana dioica* L.** — Perennial, stem 10-40 cm high, erect, simple, bare, downy only at knobs. **Fruits achenes, various and similar to *V. sambucifolia*, size 4-6 x 1.8-2.2 mm (without crest). Surface smooth, glabrous, dull, brown. 2n = 16 (32).** Native to Europe, in wet meadows, peatbogs, swamps, banks of still waters. Br, Hu, Pl, Ro, Sk, Uk.

**2599. *Valeriana montana* L.** — Perennial, stems erect, 10-50 cm high, tufted. **Fruits achenes, similar to *V. sambucifolia*, 3-4 x 1.4-1.6 mm (without crest). Surface smooth, sparse hairy, lustreless, pale- to dark-brown. 2n = 32.** Element of the Alps and Carpathians, in rocky grounds, scrubs, light forests, screes, on calcareous substrates and wet soils. Pl, Ro.

**2600. *Valeriana officinalis* L., *V. altissima* Hornem.** — Perennial, stems erect, 50-150 cm high, unramified, striate-grooved. **Fruits achenes, prolonged ovoid, spear-like, flattish, ventral side with one, dorsal side with 3 ribs, rim marginate, with 10-15 hairy bristles at the apex forming the crest, rounded at base, 2.2-2.8 x 1.1-1.4 mm**

**(without crest). Surface smooth, glabrous, reddish-brown. 2n = 14.** Native to Eurasia, in wet to swampy meadows, coastal margins and thickets, light woodlands. Br, Hu, Mo, Pl, Ro, Sk.

**2601. *Valeriana phu* L.** — Perennial, terete stems 70-120 cm high, with mostly undivided basal leaves. **Fruits achenes, oblong-ovoid, lateral compressed, concavo-convex, apex with hairy bristles in crest, bottom rounded, 3.3-3.9 x 1.3-1.7 mm. Surface with 5+1 ribs, glabrous, dull, pale-brown.** Species of uncertain origin, allegedly native to northern Anatolia; cultivated for its rhizome, which yields the drug valerian, an escape from cultivation does not appear to be fully naturalized.

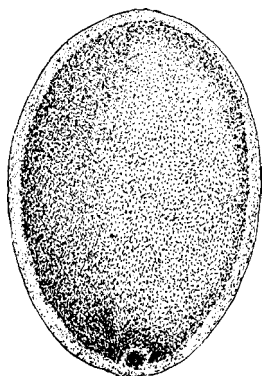
**2602. *Valeriana rossica* P. Smirnov** — Perennial, 70-160 cm high, erect, furrowed, glabrous, downy below, flowers pale-pink. **Fruits achenes, oblong-ovoid, lateral compressed, apex gradually narrowed, truncate, with pappus having hairy bristles, 2.8-3.6 x 1.2-1.4 mm. Surface with 6 ribs, glabrous, dull, brown.** Native to eastern Europe, on steppes, in shrubberies and dryer meadows, a medicinal plant. Uk.

**2603. *Valeriana sambucifolia* Mikan, *V. repens* Host** — Perennial, stems 60-150 cm high, robust, erect, simple, angular, glabrous, leafy. **Fruits achenes, oblong-ovoid, lateral compressed, apex gradually narrowed with hairy bristles in the crest, truncate, bottom rounded, 3.4-3.8 x 1.7-2 mm. Surface with 6 ribs, glabrous, dull. 2n = 56.** Native to Euro-Siberia river margins, in wet places and on shady rocks. Mo, Pl, Ro, Sk, Uk.

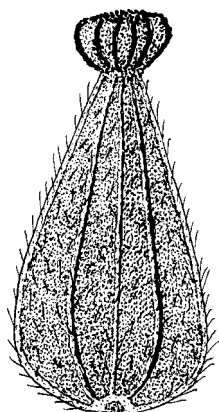
**2604. *Valeriana saxatilis* L.** — Perennial, stem erect, 5-30 cm high, simple, glabrous, striate. **Fruits achenes, similar to *V. sambucifolia*, 2-2.5 x 0.9-1.1 mm. Surface fine reticulate, glabrous, lustreless, light to pale-brown.** Native to the Alps and mountains of southern Europe, on or near rocks and screes, on calcareous grounds. Ro.

**2605. *Valeriana simplicifolia* (Rchb.) Kabath** — Perennial, stems erect, 10-40 cm high, unramified, bare, 4-angular. **Fruits achenes, prolonged ovoid, spear-like, flattish, with a rim around, dorsal side with 3 ribs, ventral side with 1 rib, with 10-14 hairy bristles at the apex in the crest, rounded at base, 3-3.6 x 1-1.3 mm (without crest). Surface glabrous, dull, smooth, reddish-brown. 2n = 16.** Native to

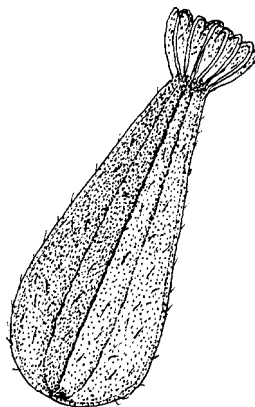




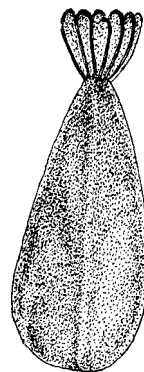
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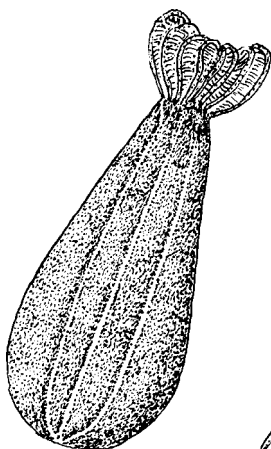
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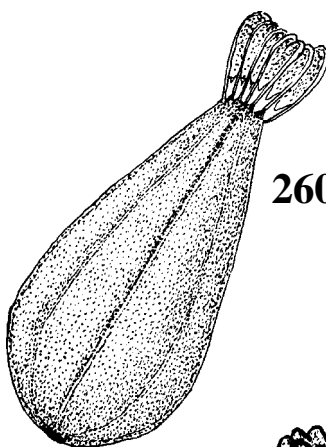
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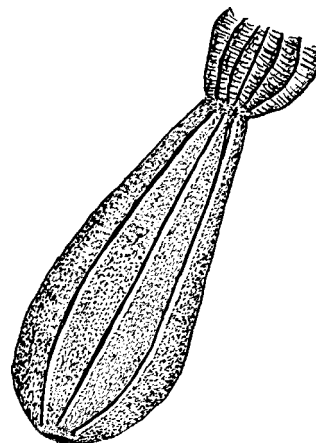
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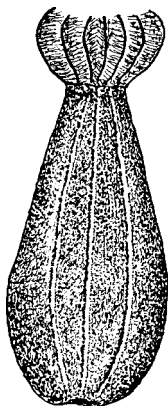
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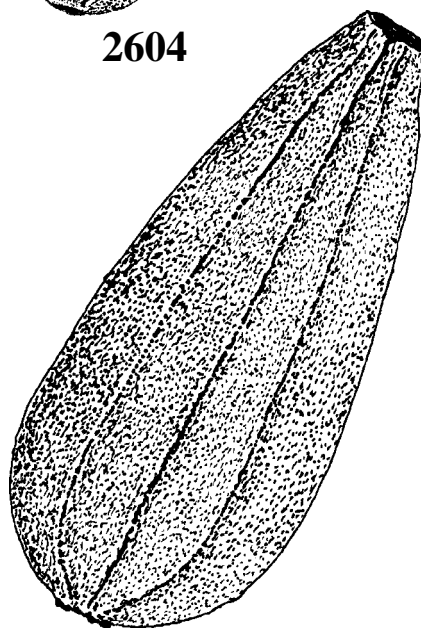
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Eurasia, in wet meadows, forest swamps and other wet places. Hu, Pl, Ro, Sk, Uk.

**2606. *Valeriana stolonifera*** Czern., *V. angustifolia* subsp. *stolonifera* (Czern.) Rostański — Perennial, stems erect, up to 100 cm high, densely pubescent below, with 4-7 pairs of leaves. **Fruits achenes, oblong-ovoid, lateral compressed, apex gradually narrowed, truncate, with hairy bristles in the crest, bottom rounded, 2.8-3.8 x 1.4-1.6 mm. Surface with 6 ribs, scarce hairy, pale-brown. 2n = 20.** Native to Eurasia, on steppe, stony slopes and in light woods of warmer areas. Mo, Sk, Uk.

**2607. *Valeriana tripteris*** L., *V. transsilvanica* Schur — Perennial, stems ascendent to erect, 10-60 cm high,  $\pm$  tufted, bare, downy at knobs. **Fruits achenes, similar to *V. sambucifolia*, 3-4 x 1.1-1.3 mm (without crest). Surface smooth, glabrous, dull, brown. 2n = 16.** Native to the Alps and Carpathians, in shady woods, overgrown rocks, scrubs and dwarf pine slopes usually calcicole. Hu, Pl, Ro, Sk, Uk.

**2608. *Valeriana tuberosa*** L. — Perennial, 15-60 cm high, flowers pink, in dense inflorescences above, stems erect, ribbed. **Fruits achenes, oblong-ovoid, lateral flattish, narrow brimmed at the margin, dorsal side with 3 longitudinal ribs, ventral with one rib, apex with a feathery corona, bottom broader than the apex, 3.2-3.8 x 1-1.2 mm (without crest). Surface dull, reddish-brown.** Native to eastern Europe, in stony slopes, steppes, shrubberies and on slopes. Mo, Uk.

**2609. *Valerianella carinata*** Loisel., *Fedia carinata* Steven — Annual, stems 5-30 cm high, bare, upper armpit shoots without flowers. **Fruits achenes, prolonged, nearly prismatic, more or less 4-angled, dorsal side convex, ventral side with deep and broad furrow, 2-2.4 x 1-1.2 mm. Surface smooth or sometimes short hirsute, brown. 2n = 16, 18.** Native to western Europe, in fields, boundaries, fallows, vineyards. Hu, Mo, Pl, Ro, Sk, Uk.

**2610. *Valerianella coronata*** (L.) DC., *V. hamata* Bastard — Annual, stems 10-30 cm high, poorly forkedly ramified, densely leafy. **Fruits achenes, obconical or ovoid, more or less square, apex with the rest of calyx, base rounded, 1.8-2.4 x 1.6-1.9 mm (without calyx). Surface scarce or dense hirsute, dorsal side convex, ventral deep depressed, pale- or dark-brown. 2n = 14.** Native to Eurasia, in fallows,

fields, on slopes and rocks, vineyards and steppes. Hu, Mo, Ro, Sk, Uk.

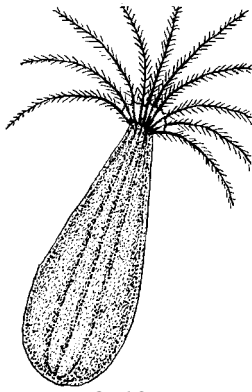
**2611. *Valerianella costata*** (Stev.) Betcke, *Fedia costata* Stev. — Annual, stems up to 20 cm high, furrowed and ribbed, leaves oblong lanceolate. **Fruits achenes,  $\pm$  globular, sterile loculi larger than the fertile ones, pericarp with more or less large, pellucid papillae and usually with prominent ribs on the sterile loculi, 2.2-2.8 x 1.5-1.8 mm.** Native to southeastern Europe, on steppes, sunny coasts, dry pastures and saline meadows. Mo, Ro, Uk.

**2612. *Valerianella dentata*** (L.) Pollich, *Fedia leiocarpa* Rchb. — Annual, stems 10-40 cm high, upper armpit shoots without flowers, glabrous. **Fruits achenes, drop-shaped or ovoid, apex with rest of calyx, base rounded, 2.4-2.8 x 1.4-1.6 mm. Surface granulate, glabrous, lustreless, pale-brown. 2n = 14-16.** Native to Europe, in cereal fields, boundaries, embankments, fallows, vineyards. Hu, Mo, Pl, Ro, Sk, Uk.

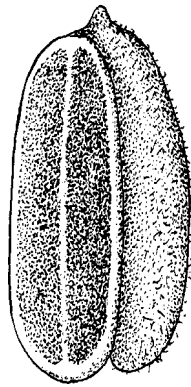
**2613. *Valerianella eriocarpa*** Desv., *V. incrassata* Chaub. — Annual, stems 10-30 cm high, pubescent at angles, rest of the surface glabrous. **Fruits achenes, ovoid or drop-shaped, dorsal side convex, ventral side slight flattish with a prolonged horse-shoe rib, apex with the rest of calyx, base rounded, 2.4-2.6 x 1.1-1.3 mm. Surface dense whitish hirsute, the base smooth, lustreless, dark-brown.** Native to Eurasia, in fields and fallows. Ro.

**2614. *Valerianella locusta*** (L.) Laterrade em. Betcke, *V. olitoria* (L.) Pollich — Annual, stems 10-25 cm high, hirsute at angles. **Fruits achenes, in outline irregular square or spherical obovoid with two elongate striate and three rails on each side, 1.5-1.9 x 1.8-2.2 mm. Surface fine foveolate, dull, glabrous, yellowish-white or greyish. 2n = 14, 16, 18.** Native to the Mediterranean, in meadows, pastures, grassy fallows, dry arable lands, dunes. Hu, Mo, Pl, Ro, Sk, Uk.

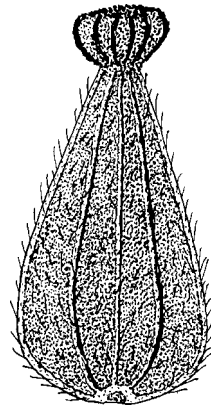
**2615. *Valerianella mixta*** (L.) Dufur., *V. dasycarpa* Link — Annual, plant similar in appearance to *V. eriocarpa*. **Fruits achenes, ellipsoidal to spherical, ventral side with 2 or 3 ribs, apex with the larger rest of calyx, 2.4-2.7 x 1.2-1.4 mm. Surface dense hooked hirsute, dark-brown, ribs pale.** It occurs in the open and as a weed in fields in the Ukraine.



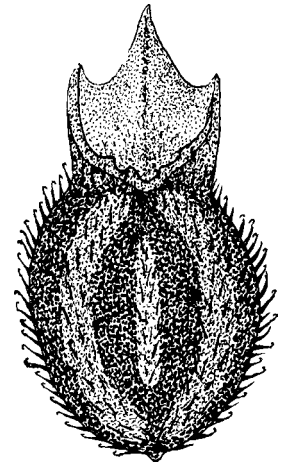
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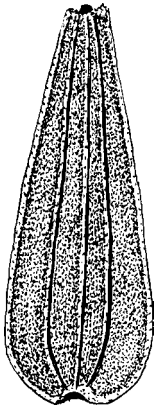
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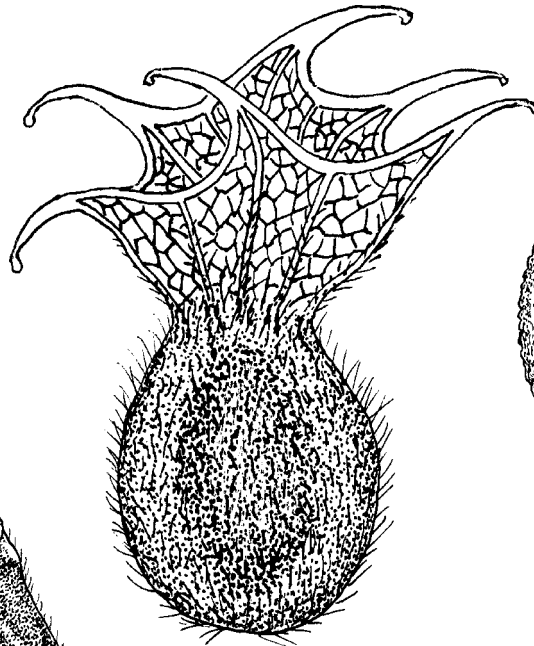
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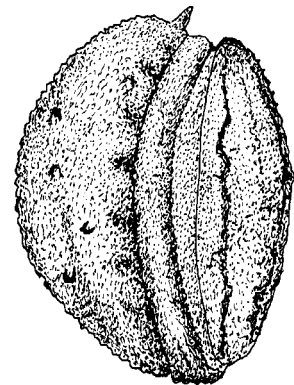
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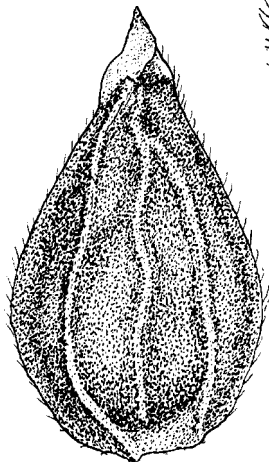
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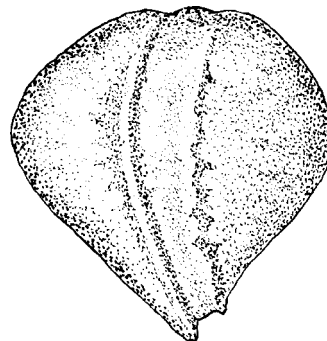
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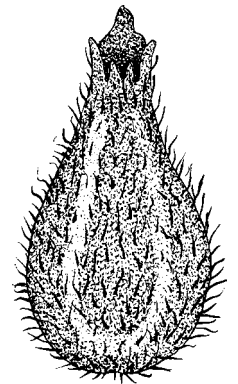
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**2616. *Valerianella pumila* (L.) DC., *V. tridentata* (Stev.) Betcke** — Annual, stems up to 40 cm high, pubescent. **Fruits achenes, spherical, triangular in transversal section, dorsal side convex, with darker strip in the centre, ventral side partly flat, curved into a deep socket, 2.5-3.1 x 2.3-2.7 mm. Surface smooth, lustreless, pale- to dark-brown. 2n = 14.** Native to Eurasia, on sunny rocky and stony slopes, in sandy and waste places, fields. Hu, Mo, Ro, Sk, Uk.

**2617. *Valerianella rimosa* Bast., *Valeriana auricula* DC.** — Annual, stem 10-50 cm high, slender, armpit shoots with single flower. **Fruits achenes, broad ovoid to spherical, biconvex, dorsal side with two or four ribs, ventral side with one deep furrow, 2-2.6 x 1.7-2.1 mm. Surface fine granulate, dull, glabrous, brown. 2n = 14.** Native to Europe, cereal fields, grasslands, loamy fallows, dry slopes. Hu, Pl, Ro, Sk, Uk.

**2618. *Valerianella turgida* (Stev.) Betcke, *Fedia turgida* Stev., *V. trigonocarpa* DC.** — Annual, stems 10-40 cm high, ribbed, hairy below and on the ribs, leaves oblong-lanceolate. **Fruits achenes, very swollen, from above and below not deep engraved, 2 sterile loculi of the fruit are 3-4 times larger than the fertile loculi, 2.2-2.8 x 2.2-2.8 mm. Surface smooth, sparse hairy, dull, pale-brown.** Native to the Balkan Peninsula as far as Asia Minor, in fields and grassy places. Mo, Ro, Uk.

### 123. DIPSACACEAE

**2619. *Dipsacus laciniatus* L.** — Biennial, stems 50-150 cm high, spiny, erect, forkedly ramified above. **Fruits achenes, narrow prismatic, 4-angled, appressed-hairy, apex truncate with the rest of calyx and stigma in the centre, 5.5-6.5 x 1.5-1.7 mm. Surface dull, dark-brown. 2n = 16, 18.** Native to Eurasia, stony and waste places, boundaries, vineyards, forest margins, roadsides. Hu, Mo, Pl, Ro, Sk, Uk.

**2620. *Dipsacus sativus* (L.) Honck., *D. fullonum* L.** em. Huds. — Biennial, stems 50-200 cm high, spiny, erect and bare at angles. **Fruits achenes, square, narrowly prismatic, with acute angles, apex truncate with tooth-leafed border and hilum in the centre, 3.7-4.3 x 1.4-1.6 mm. Surface fine longitudinal wrinkly, very fine hairy, dull, pale-brown to brown. 2n = 18.** Native to southern Europe, previously cultivated, seldom naturalized. Hu, Sk, Uk.

**2621. *Dipsacus sylvestris* Huds., *D. fullonum* auct.** — Biennial, stem 50-200 cm high, erect, angular, bare, forkedly ramified above. **Fruits achenes, narrow prismatic, square with acute angles, apex truncate with short rests of calyx and with hilum in the centre, base rounded, 4.4-5 x 1.4-1.6 mm. Surface smooth, very fine hairy, glabrous, lustreless, brown. 2n = 18.** Native to Europe, wet places, river and brookbanks, ditches, roadsides and waste places; in all Carpathian regions.

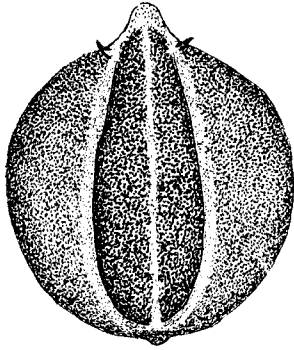
**2622. *Virga pilosa* (L.) Hill, *Dipsacus pilosus* L.** — Biennial, stem erect, 30-150 cm high, sulcate, spiny, bristly or bare at angles. **Fruits achenes, conic prismatic, 4-angled, apex truncate, with pyramidal stigma in the middle, 4.3-4.7 x 1.6-1.8 mm. Surface smooth or very fine, short hirsute, blackish-brown. 2n = 18.** Native to Europe, scrubs, boundaries, lowland wet forest margins, ruins. Hu, Mo, Pl, Ro, Sk, Uk.

**2623. *Virga strigosa* (Willd. ex Roem. et Schult.) Holub, *Dipsacus strigosus* Willd. ex Roem. et Schult.** — Biennial, stem 1-2 m high, erect, sulcate, spiny and bristly at angles. **Fruits achenes, narrow prismatic, 4-angled, apex truncate with tooth-leafed rest of calyx and stigma in the centre, 4.3-4.7 x 1.2-1.4 mm. Surface smooth with short appressed hairs, dull, greyish-brown.** Native to the Ukraine, previously cultivated and hauling deep into the Carpathians. Mo, Pl, Ro, Sk, Uk.

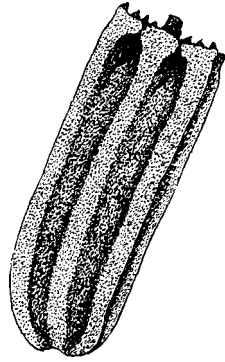
**2624. *Cephalaria gigantea* (Ledeb.) Bobrov, *C. tatarica* Roem. et Schult.** — Perennial, stems 1-2 m high, grooved, bare, shortly hirsute above. **Fruits achenes, in outline 3-4 angled, slight flattish, mostly slight bended, each side with 2 deep furrows, apex with 8 teeth, 7-9 x 2.3-2.7 mm. Surface hirsute, blackish-brown. 2n = 18, 36.** Native to Caucasus; rarely cultivated as an ornamental in gardens and uniquely naturalized.

**2625. *Cephalaria litvinovii* Bobrov, *C. tatarica* Ledeb.** — Perennial, stems 150-200 cm high, ramified below. **Fruits achenes, in outline 4-angled, slight bended and flattish, each side with 2 deep furrows, apex with 8 teeth, 7.8-8.2 x 2-2.3 mm. Surface dense hairy, grey-brown. 2n = 36.** Native to the Ukraine and hauling deep into the Carpathians. Uk.

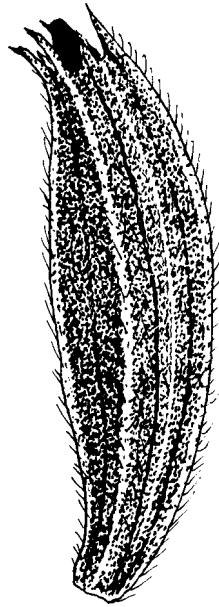
**2626. *Cephalaria radiata* Gris.** — Perennial, stems 60-120 cm high, erect, branched, hirsute below, glabrescent above. **Fruits achenes, 4-angled, angles**



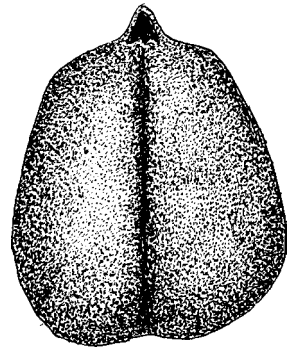
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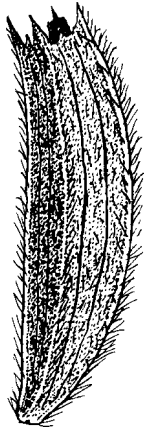
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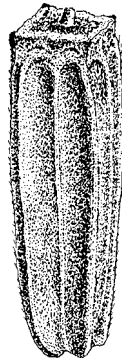
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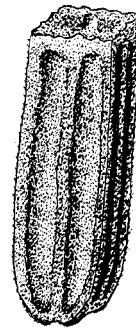
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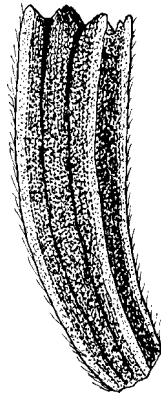
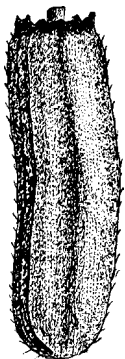


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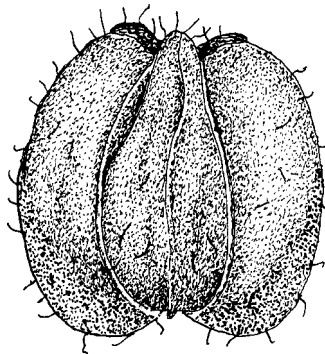


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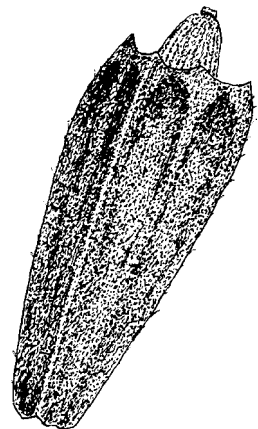
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obtuse, with 2 deep furrows each side, apex 8-dentated, 4.5-6 x 1.5-1.7 mm. Surface slight hairy, greyish-brown. Endemic to Romania, on sunny, dry, loamy or stony slopes in mountains. Ro.

**2627. *Cephalaria syriaca* (L.) Schrad.** — Annual, stem erect, 20-70 cm high, ramified, grooved, bristly hirsute. **Fruits achenes, ellipsoid, calyx cupulate, involucre 8-angled and finished with apical spines each (4 longer, 4 shorter), 5-5.6 x 2.1-2.5 mm. Surface dull or slight lustrous, appressed hairy or bare, yellowish-brown.  $2n = 10$ .** Native to the eastern Mediterranean region and western Asia; hauling into the Carpathians.

**2628. *Cephalaria transsilvanica* (L.) Schrad., *Scabiosa transsilvanica* L.** — Biennial, stems 30-100 cm high, erect, ramified, bristly hirsute below, bare above. **Fruits achenes, ovoid, weakly 4-angled, apex with the toothed rest of calyx, 4.2-5 x 1.5-1.9 mm. Surface dense hirsute, greyish-brown.  $2n = 18$ .** Native to Eurasia, sunny slopes, stony pastures, steppes and embankments in lowlands and uplands. Hu, Mo, Ro, Sk, Uk.

**2629. *Cephalaria uralensis* (Murr.) Roem. et Schult., *C. corniculata* Waldst. et Kit.** — Perennial, stems 30-60 cm high, truncate at base, branched, hirsute below, glabrescent above. **Fruits achenes, 4-angled, cylindric, apex with 8 teeth, each side with 2 deep furrows, angles obtuse, 5-6 x 1.7-2 mm. Surface appressed hirsute, greyish-brown.  $2n = 18$ .** Native to central Europe and the Balkan Peninsula as far as Russia, sunny slopes. Mo, Ro, Uk.

**2630. *Succisa pratensis* Moench, *Scabiosa succisa* L.** — Perennial, bare, seldom downy, forkedly ramified above. **Fruits achenes, in outline 4-angled with 8 prolonged, dense hairy ribs, 4 corners finish with teeth, pappus with 5 black hairpins, 4-5 x 1.3-1.6 mm. Surface dense hirsute, yellowish-brown.  $2n = 20$ .** Native to Euro-Siberia, wet and peatbog meadows and pastures, forest clearings. Hu, Mo, Pl, Ro, Sk, Uk.

**2631. *Succisella inflexa* (Kluk) G. Beck, *Scabiosa inflexa* Kluk** — Perennial, stems ascendent, 60-80 cm high, bare, rooting down at the basal knots. **Fruits achenes, prolonged ovoid or ellipsoid with 8 deep furrows and 8 equal ribs, 4-5 x 1.3-1.6 mm. Surface glabrous, fine hirsute, greenish or greenish-brown.  $2n = 20$ .** Native to Europe, wet places, meadows,

pastures, reeds, swamps, forest clearings; rare in all Carpathian regions.

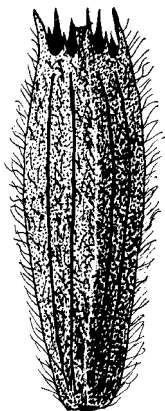
**2632. *Knautia arvensis* (L.) Coulter, *Scabiosa arvensis* L.** — Biennial or perennial, stems poorly tufted, erect, 25-75 cm high, often branched, bristly hirsute and downy, bare above. **Fruits achenes, ellipsoid or ovoid, with distinct or less distinct 4-ribs, 4.4-5 x 1.9-2.3 mm. Surface smooth, dense and long setaceous, greenish or yellowish-brown.  $2n = 40$ .** Native to Euro-Siberia, dryer meadows, turfs, roadside verges, fields, open woods; throughout the Carpathians.

**2633. *Knautia dipsacifolia* (Schrank) Kreutzer, *K. pannonica* Jacq.** — Perennial, rhizome with flowering stems, which are 40-150 cm high, sometimes ramified, sparsely leafy. **Fruits achenes, ellipsoid with 4-angled mostly indistinct ribs, pappus c. 1/2 of the seed length, 5.2-6.2 x 2.1-2.5 mm. Surface dull, setaceous, greenish- or yellowish-brown.  $2n = 60$ .** Native to the mountains of central Europe, light forest margins and thickets, tall-herb communities and mountain meadows. Hu, Pl, Ro, Sk, Uk.

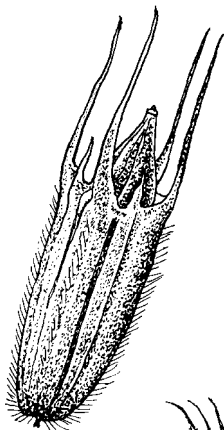
**2634. *Knautia drymeia* Heuff., *Scabiosa sylvatica* L.** — Perennial, stems 50-100 cm high, ascendent at base, rhizome with leaf rosette. **Fruits achenes, elliptical with 4-angled longitudinal ribs, rust of calyx mostly 8-pointed, pappus about 1/2 of the seed length, 4.8-5.4 x 2-2.4 mm. Surface dull, setaceous, yellowish-brown.  $2n = 40$ .** Native to central and southern Europe, light forests and shrubberies, wet, humous, stony and loamy grounds. Hu, Ro, Sk.

**2635. *Knautia kitaibelii* (Schult.) Borbás, *K. carpatica* Heuff.** — Perennial, stem only 50 cm high, hirsute to grey, downy. **Fruits achenes, prolonged ellipsoidal, slight flattish, 4-angled and ribbed, 5.3-5.9 x 1.7-1.9 mm. Surface dull, setaceous, yellowish-brown.  $2n = 40$ .** Native to central and eastern Europe; in the Carpathians rare, dryer meadows, pastures, fallows, forest margins, scrubby slopes. Pl, Sk, Uk.

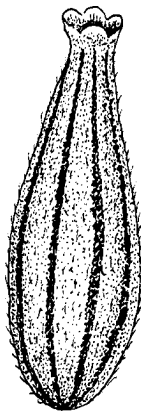
**2636. *Knautia longifolia* (Waldst. et Kit.) Koch, *Scabiosa longifolia* Waldst. et Kit.** — Perennial, stems 20-60 cm high, erect or ascendent, simple or forkedly ramified. **Fruits achenes, ellipsoidal, setaceous, flattish, 4-angled, distinct only in the upper part, pappus about 1/2 of the seed length, 6-7 x 1.9-2.1 mm.  $2n = 20$ .** Native to eastern Carpathians and eastern Alps, wet mountain meadows, screes and wood margins, calcareous grounds. Ro, Uk.



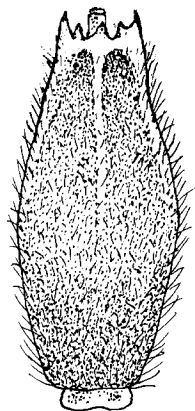
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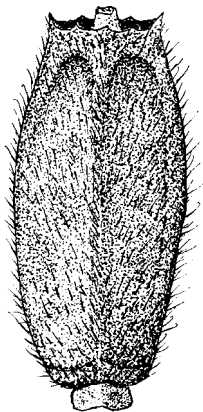
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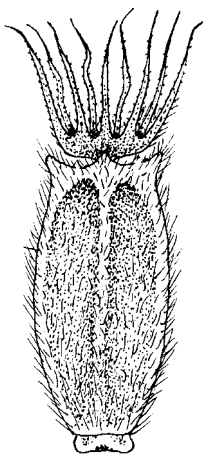
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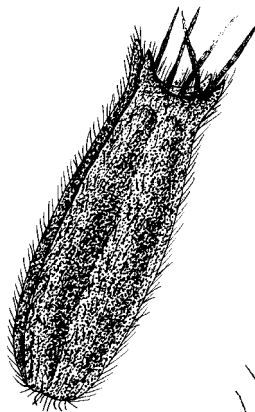
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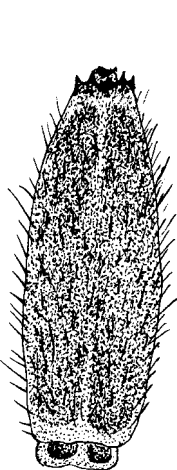
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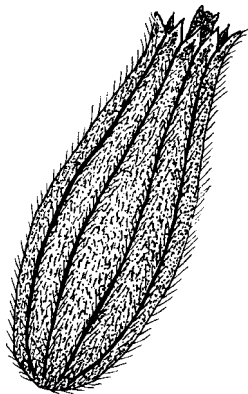
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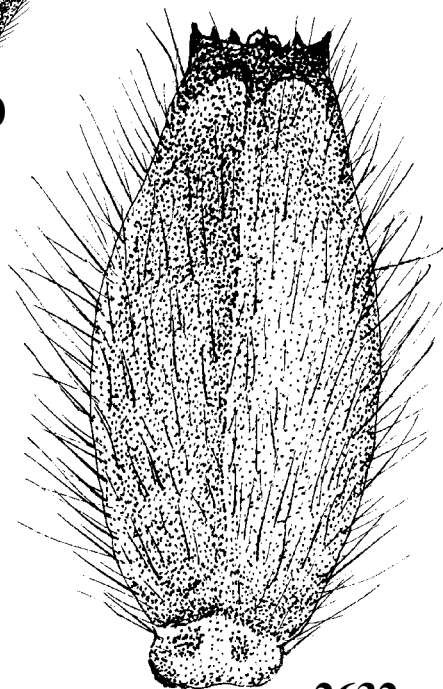
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**2637. *Knautia macedonica*** Gris. — Perennial, stems 50-60 cm high, the base ascending, erect, tomentose, ramified below. **Fruits achenes, nearly ellipsoidal, tetragonal, slight flattish, rest of calyx notched, 4.8-5.2 x 1.9-2.2 mm. Surface setaceous, dull, yellowish- to dark-brown.** Native to the Balkan Peninsula, in scrubs and open woods. Hu, Ro.

**2638. *Scabiosa argentea*** L., *S. eburnea* Sibth. et Sm., *S. thracica* Velen. — Biennial or perennial, pubescent to subglabrous, stems 30-70 cm high, ascending branched, corolla whitish- or pinkish-yellow. **Fruits, obovate with 8 ribs, apex with membranous corona and 5 brown spinulose bristles, 3.2-4.2 x 2.7-3.3 mm. Surface of the bottom part with long hairs. 2n = 16.** Native to southern Europe and Asia Minor, on sterile stands, sandbanks. Ro, Uk.

**2639. *Scabiosa atropurpurea*** L., *Sixalis atropurpurea* (L.) Greuter — Biennial, stems 20-60 cm high, erect, basal leaves oblong, lanceolate, flower corolla blue, pink or white. **Fruits achenes, narrowed at the bottom part, setaceous on 8 ribs, apex with membranous corona and 5 dark-brown spinulose bristles, 5-6 x 4-5 mm. Surface dull, strawy yellow. 2n = 16, 18, 36, 54.** Native to southern Europe; in the Carpathians rarely cultivated for ornament in gardens.

**2640. *Scabiosa banatica*** Waldst. et Kit. — Biennial to perennial, up to 100 cm high, robust, glabrous at base. **Fruits achenes, bottom part at base narrow, on ribs sparse hirsute, apex with membranous corona and 5 dark-brown, smooth bristles, 4-4.5 x 2.1-2.3 mm. Surface pale-brown.** Native to the southeastern Carpathians and the Balkan Peninsula, arid slopes of montane zones. Ro.

**2641. *Scabiosa canescens*** Waldst. et Kit., *S. suaveolens* Desf. ex DC. — Perennial, stems erect or ascending, 15-60 cm high, downy, poorly ramified above. **Fruits achenes, ovoid, 8-angled or ribbed, with membranous corona and five blackish and spinulose bristles at the apex, 3.5-4.5 x 2.2-2.8 mm. Surface lustreless, dull, dense setaceous. 2n = 16.** Native to western and central Europe, sunny grassy or scrubby slopes, boundaries, mostly in uplands. Hu, Pl, Ro, Sk.

**2642. *Scabiosa caucasica*** M. Bieb., *Trichocephalus caucasicus* (M. Bieb.) Á. et D. Löve — Perennial, stems erect, 40-60 cm high. **Fruits achenes, slight conic to elliptic, tetragonal, with 8 setaceous ribs, apex with membranous corona and 5 spinulose**

**bristles, 8-9 x 4-5 mm. Surface dull, dense hirsute. 2n = 16, 18, 36, 54.** Native to the Caucasus, grown in many cultivars in gardens, often naturalized.

**2643. *Scabiosa columbaria*** L., *S. dubia* Velen. non Moench — Biennial or perennial, stems erect, 20-100 cm high, ramified, bare or sparsely hirsute. **Fruits achenes, prolonged ovoid to ellipsoid with 8 obtuse ribs, base narrowed, apex with 5 bristles and violetish membranous calyx, 3.2-3.8 x 1.2-1.6 mm. Surface on ribs whitish setaceous, smooth, lustreless, yellowish-white. 2n = 16.** Native to Eurasia, dry meadows, grassy slopes, scrubs, pastures; in all Carpathian regions.

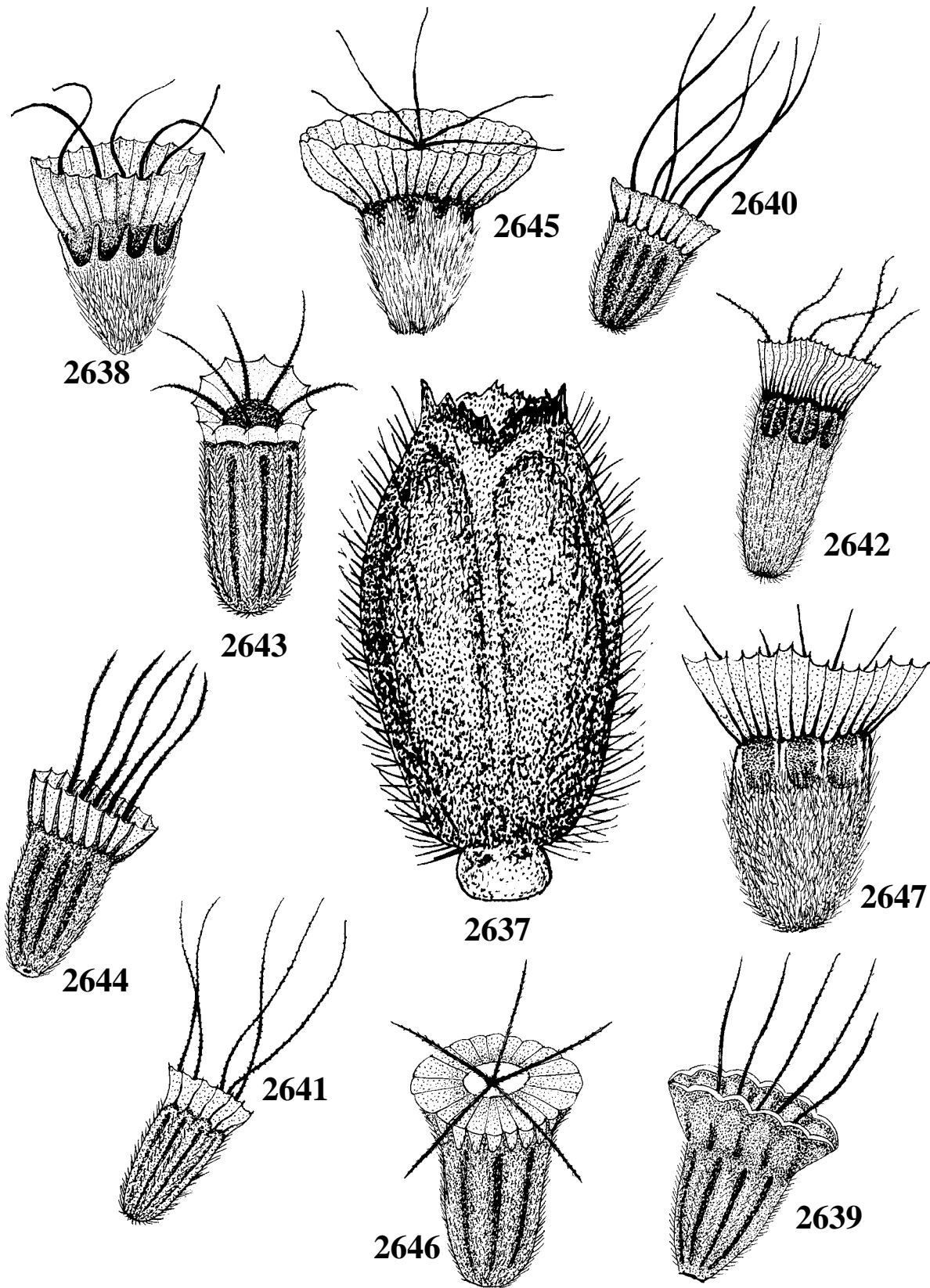
**2644. *Scabiosa lucida*** Will., *Asterocephalus lucidus* (Vill.) Rchb. — Perennial, stems erect, 10-50 cm high, simple, seldom ramified above, with 1-3 headlets. **Fruits achenes, ellipsoid or obovoid with 8 obtuse ribs, base with membranous rests of calyx and 5 long bristles, 3.2-3.8 x 2.1-2.3 mm. Surface on ribs whitish, setaceous, dirty yellowish-white. 2n = 16.** Native to the mountains of central and southeastern Europe, stony and shrubby slopes, overgrown screes, mostly on stony calcareous grounds. Pl, Ro, Sk.

**2645. *Scabiosa micrantha*** Desf. — Annual, shortly hirsute with erect hairs, stems 20-60 cm high, branched. **Fruits achenes, obovoid, apex truncate, with membranous corona and 5 long bristles, bottom narrowed, 3.8-4.3 x 2.9-3.2 mm. Surface dense white-haired, the rest pale-brown.** Native to the Balkan mountain dry stony slopes. Rarely Ro.

**2646. *Scabiosa ochroleuca*** L., *Asterocephalus ochroleucos* (L.) Wallr. — Perennial, stems erect, 20-80 cm high, downy, long-ramified from half above. **Fruits achenes, conical, apex with the membranous garlandlet of calyx and 5 dark-brown spinulose bristles, 3.6-4.4 x 2.4-2.8 mm. Surface lustreless, yellowish, 8 ribs setaceous. 2n = 16.** Native to Eurasia, sunny dry meadows, pastures, shrubby slopes, overgrown stony places, embankments and roadsides throughout the Carpathians.

**2647. *Scabiosa rotata*** M. Bieb. — Annual, densely pubescent, stems 10-50 cm high, erect, ramified, lower leaves oblong-lanceolate, upper leaves lyrate. **Fruits achenes, ellipsoidal, apex truncate, with a membranous corona and 5 blackish and spinulose bristles, bottom with 8 double ribs, 5.5-6.5 x 5-6 mm. Surface dense haired, hairs white.** Native to the





central part of the Balkan Peninsula and to the Crimea, in dry and stony places. Uk.

**2648. *Scabiosa triandra* L., *S. gramuntia* L.** – Perennial, stem often ramified from base. **Fruits achenes, obovoid, at the apex with membranous rests of calyx and five fine hairy bristles, 4-5 x 3-4 mm. Surface smooth, dull, yellowish, setaceous on ribs. 2n = 16.** Native to southern and central Europe, dry steppe slopes, scrubs, pastures, meadows. Hu, Sk.

**2649. *Scabiosa ucrainica* L.** – Biennial, stems 50-100 cm high, strong ramified. **Fruits achenes, obovoid, rich and rough setaceous in the bottom part, with 8 ribs and furrows in the middle part, apex with membranous corona and 5 brown spinulose bristles, 3.2-4.2 x 2.7-3.3 mm. Surface whitish-yellow.** Native to southern Europe and Asia Minor, in poor sandy soils. Mo, Ro, Uk.

#### 124. OLEACEAE

**2650. *Olea europaea* L.** – Shrub or tree, up to 15 m high, evergreen twigs  $\pm$  4-angular or terete, prickly. **Stones oblong or obovoid, 6-8 x 4-6 mm (subsp. *sylvestris* – a), 16-22 x 7-10 mm (subsp. *europaea* – b). Surface deep furrowed, lustreless, pale-incarnadine. 2n = 46.** Native to western Asia and in the Mediterranean, in dry rocky places, commonly cultivated in many cvs for its edible fruit, in warmer areas, an important source of oil; in the Carpathians uniquely planted in the warmest areas, as an interesting tree. Ro, Uk.

**2651. *Fraxinus americana* L., *F. acuminata* Lam., *F. alba* Marsh.** – Tree, up to 40 m, young twigs dark-green or brown, bare and glossy. **Fruits samaras (right), winged in the front, wing oblong shovel-shaped, 30-50 x 5.6-6.4 mm. Seeds (left) cylindric, dorsal and ventral sides convex, with longitudinal furrow, apex acuminate, 16-18 x 4-5 mm. Surface fine longitudinal stripped, faint lustrous, yellowish-brown. 2n = 46, 92, 138.** Native to North America; in the Carpathians cultivated in parks, town verdure and experimentally in woods. Mo, Ro, Sk, Uk.

**2652. *Fraxinus angustifolia* Vahl, *F. ptačovskiyi* Domin** – Tree, up to 25 m high, twigs glabrous. **Fruits samaras, obovate-oblong to lanceolate with a wing, 30-40 x 7-9 mm. Seeds lanceolate, slight convex, longitudinal wrinkly, narrowed at the apex and base, 15-20 x 4-6 mm. Surface lustreless, brown to dark-brown.** Endemic to Pannonia, lowland wet

forests, alluvial soils, riverbanks and flood plains. Hu, Ro, Sk, Uk.

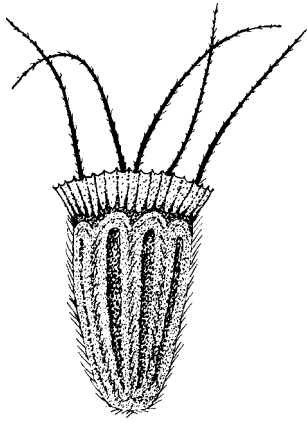
**2653. *Fraxinus excelsior* L.** – Tree, seldom shrub, up to 40 m, bark grey, oblong-obcordate to lanceolate, young twigs rounded, rough, budlets black. **Fruits samaras, narrow corona ovoid-globose, with a wing, 45-50 x 6-8 mm. Seeds rounded at apex and base 15-17 x 3.5-4.5 mm. Surface longitudinal wrinkly, slight convex, lustreless, dark-brown. 2n = 46.** Native to central and southern Europe, forming woods on calcareous soils, often planted in parks and gardens. Hu, Mo, Pl, Ro, Sk, Uk.

**2654. *Fraxinus lanceolata* (Sargh.) Borkh., *F. viridis* Michx.** – Tree, up to 20 m high, twigs bare. **Fruits samaras (left), narrow paddle- or linear-shaped, wing apex blunt, 32-40 x 4.5-6 mm. Seeds (right) shuttle-shaped, pointed at both ends, 13-16 x 1.9-2.1 mm. Surface dull, furrowed, orange-brown.** Originally growing in North America; sometimes planted in parks and town verdure. Mo, Ro, Uk.

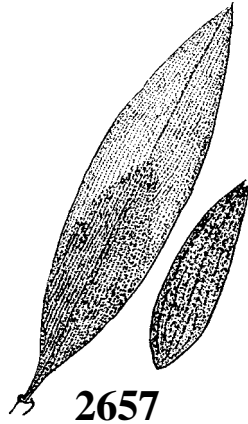
**2655. *Fraxinus ornus* L., *Ornus europaea* Pers.** – Shrub or tree, up to 20 m high, corona spherical, twigs smooth, lustrous, grey, weakly 4-angular. **Fruits samaras (left), obovate-linear to oblong, acute to emarginate, winged, 20-30 x 4-5 mm. Surface dark-brown. Seeds (right) elliptic, convex, furrowed, 8-9 x 1.1-1.4 mm. Surface slight lustrous, dark-brown. 2n = 46.** Native to southcentral Europe, mixed woods, thickets, overgrown slopes, sunny rocky places. Hu, Pl, Ro, Sk, Uk

**2656. *Fraxinus oxycarpa* M. Bieb. ex Willd.** – Tree, up to 25 m high, twigs glabrous, budlets brown, black later on. **Fruits samaras (right), prolonged elliptic or linear-lanceolate, narrowed at both ends, with the distinct middle vein, 30-35 x 6.5-7.3 mm. Seeds (left) broader and pointed on the upper part, furcate at base, 11-13 x 3.8-4.2 mm. Surface furrowed, dull, dark-brown.** Native to southeastern Europe and southwestern Asia, warm sunny and sandy places, occurrence sporadic. Hu, Mo, Pl, Ro, Sk, Uk.

**2657. *Fraxinus pallisae* Wilmott** – Tree, up to 25 m high, young twigs densely pubescent. **Fruits samaras, narrow elliptical or elliptical-lanceolate, apex and base of the wing narrowed, 30-40 x 7-9 mm. Surface pubescent. Seeds elliptic, furrowed, 12-17 x 3-5 mm. Surface slight lustrous, dark-brown.** Native to southeastern Europe, wet, overflowed, swampy places and river edges. Mo, Ro.

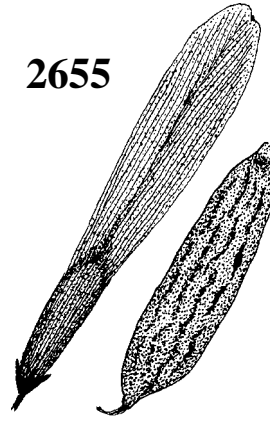


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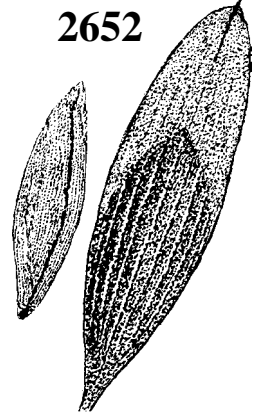


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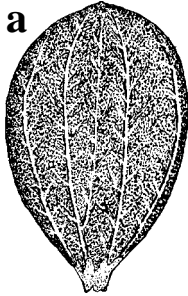
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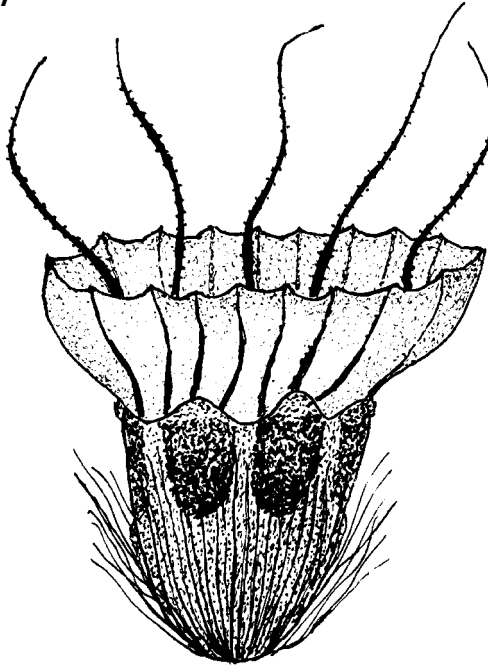
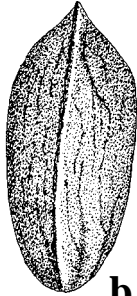


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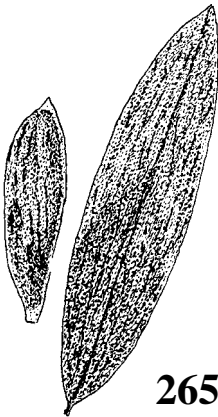
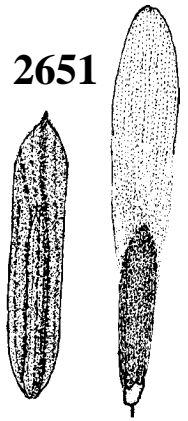
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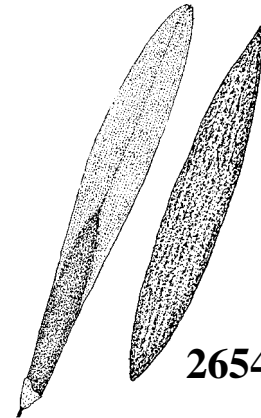
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**2658. *Fraxinus pensylvanica*** Marsh., *F. pubescens* Lam. — Tree, up to 20 m high, twigs densely downy. **Fruits samaras (left), prolonged lanceolate, wing apex blunt or pointed, 50-60 x 4.5-5.2 mm. Surface pale-brown. Seeds (right) pointed toward both ends, 16-20 x 1.5-1.8 mm. Surface furrowed, lustreless, dark-brown. 2n = 46.** Originally growing in North America, often planted in parks for its decorative flowers and persistent fruits, sometimes cultivated for timber in forests. Hu, Mo, Ro, Sk, Uk.

**2659. *Ligustrum acutissimum*** Koehne — Shrub, up to 3 m high, with lay-out twigs, young twiglets pubescent. **Seeds oval or elliptic, dorsal side convex, ventral slight flattish with longitudinal groove, 7-8 x 3-4 mm. Surface deep furrowed, dull, brown to blackish-brown.** Native to central China; in the Carpathians rarely cultivated in parks.

**2660. *Ligustrum ibota*** Siebold et Zucc., *L. ciliatum* Siebold. — Shrub, up to 2 m high, twigs mostly horizontal. **Seeds oval, dorsal side convex with a number of deep, longitudinal furrows, ventral flattish with one longitudinal furrow, 3.9-4.3 x 2.4-2.7 mm. Surface reticulate-foveate, dull, dark-brown to black.** Originally introduced from Japan; rarely cultivated in parks, gardens and fences.

**2661. *Ligustrum lucidum*** Aiton fil., *L. japonicum* auct. eur. non Thunb. — Tree, up to 10 m high, with glabrous twigs, evergreen leaves. **Seeds oval, dorsal side convex, ventral flat or slight rooflike with longitudinal groove, 4.6-5 x 3.1-3.4 mm. Surface dense furrowed, dull, pale-brown.** Originally growing in China and Japan; widely planted for hedges (often as a golden-leaved cv.); in the Carpathians very rare, in the warmest areas.

**2662. *Ligustrum obtusifolium*** Siebold et Zucc. — Shrub, up to 3 m high with lay-out or arcuate twigs. **Seeds obovate or elliptical, dorsal side convex, ventral ± flattish with longitudinal groove, apex rounded, base narrowed, 5-6 x 3-3.6 mm. Surface deeply furrowed, dull, brown.** Native to Japan; in the Carpathians rarely cultivated in parks.

**2663. *Ligustrum ovalifolium*** Hassk. — Shrub, up to 5 m high, twigs bare ± evergreen leaves. **Seeds obovate to elliptic, 5.4-5.8 x 3.2-3.5 mm. Surface deeply irregular furrowed, lustreless, violet- to blackish-brown. 2n = 46.** Originally growing in Japan; in the Carpathians often cultivated in parks and hedges, mostly in cv. “*aureum*”, locally naturalized.

**2664. *Ligustrum vulgare*** L. — Shrub, up to 3 to 5 m high, twigs thin, smooth, greyish, in young stage downy and brown. **Seeds elliptic, obovate, flattish from the side, 5-6 x 3-3.6 mm. Surface deep furrowed, fine favulariate, lustreless, violet-black. 2n = 46.** Euro-Siberian element, deciduous and mixed woodland margins, open scrubs, moist places, somewhat calcicole; commonly cultivated for edges in gardens and town verdure; throughout the Carpathians.

**2665. *Ligustrina amurensis*** Reg., *Syringa amurensis* Rupr. — Mostly a tree, up to 10 m high. **Seeds elliptic, flattish, narrowed toward both ends, winged around seed, 11-12 x 4-4.5 mm. Surface of dorsal side rough and with a rib, ventral side with a smooth, dark-brown suture, wing pale-brown.** Native to eastern Asia; in the Carpathians rarely cultivated as a decorative shrub.

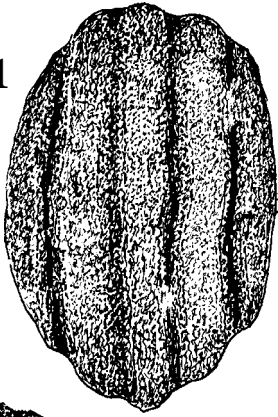
**2666. *Forsythia europaea*** Degen et Bald. — Deciduous shrubs, up to 2 m high, with upright branches. **Fruits capsulae, prolonged elliptic, mostly curved, dorsal and ventral sides convex, with two lateral ribs and one rib in the middle of the ventral side, 5.4-6 x 1.8-2.2 mm. Surface fine granulate, slight lustrous, glabrous, goldish-yellow to brown. 2n = 38.** Native to southeastern Europe (Albania); rarely cultivated in parks and arboretums. Ro, Uk.

**2667. *Forsythia suspensa*** (Thunb.) Vahl, *F. sieboldii* Dipp., *Syringa suspensa* Thunb. — Shrub, up to 3 m high, erect, twigs curved down. **Fruits capsulae, prolonged elliptic, dorsal side with broad wing, two lateral and one ventral ribs, 7-8 x 2.4-2.8 mm. Surface fine waved, slight lustrous or dull, dark-brown, wing pale-brown. 2n = 28.** Originally growing in China; in Europe often cultivated in parks, sometimes naturalized in fences.

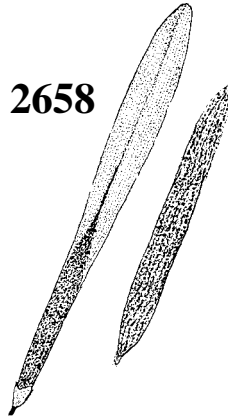
**2668. *Forsythia viridissima*** Lindl. — Shrub, up to 3 m high, twigs erect, green when young, rough, ± hollow. **Fruits capsulae, prolonged, irregular shaped, winged, 4.8-5.4 x 1.8-2.2 mm. Surface fine waved, slight lustrous, glabrous, yellowish-brown. 2n = 28.** Originally growing in China; in the Carpathians often cultivated in parks, orchards, squares.

**2669. *Fontanesia fortunei*** Carr., *F. chinensis* Hance — Shrub, up to 5 m high, deciduous, twigs 4-angular. **Fruits samaras, with 1 or 2 seeds,**

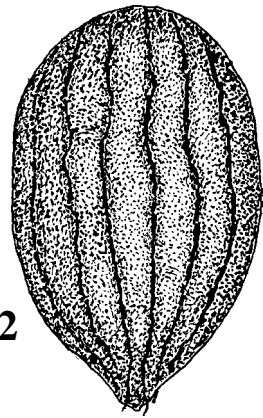
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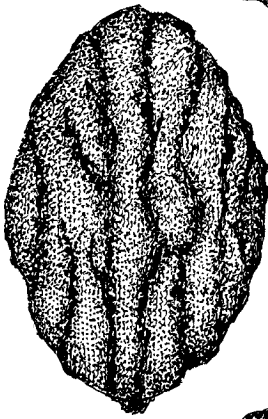
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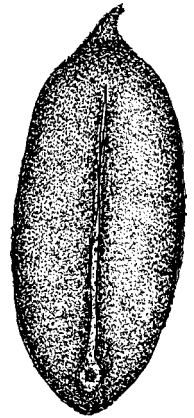
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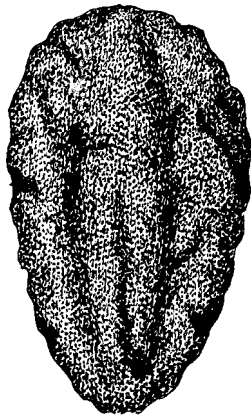
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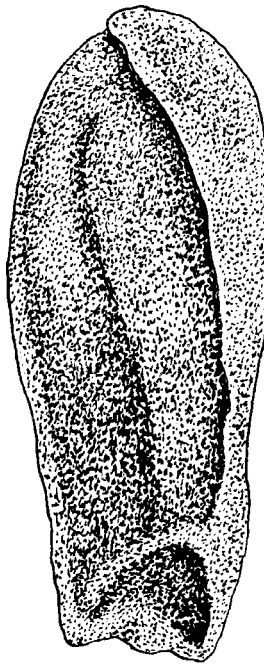
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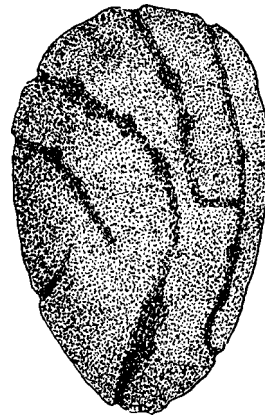
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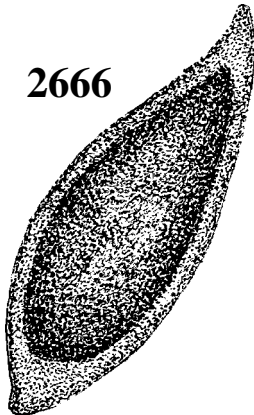
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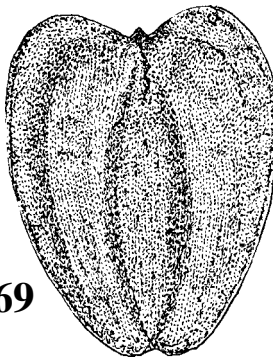
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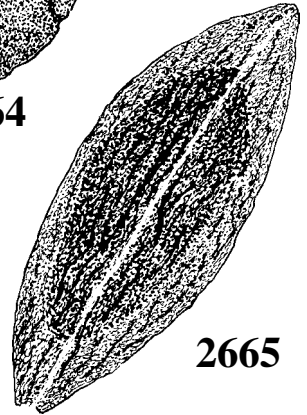
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2669



2665



**cordiform, flattish, winged, 6.6-7.4 x 4.8-5.2 mm. Surface rough, dull, yellowish-green to orange-brown.** Originally growing in China; sometimes cultivated in parks and gardens. Ro, Uk.

**2670. *Fontanesia philliraeoides*** Labill., *F. angustifolia* Dipp. — Small, very squeamish shrub, up to 3 m high, densely branched, with fine saw-shaped leaves. **Fruits samaras, flat, 1- or 2-seeded, elliptic or semispherical, winged, 6-9 x 5-6 mm. Surface rough, lustreless, greenish-brown.** Native to the eastern Mediterranean region and Asia Minor, dry rocky places, waste grounds, mixed deciduous woodlands; rarely cultivated in parks. Hu, Uk.

**2671. *Syringa emodi*** Wall. — Shrub, up to 5 m high, with erect twigs and stinkard flowers. **Fruits capsulae, oblong-elliptic, dorsal side convex with longitudinal rib, ventral side concave, margin narrowly winged around, 9-11 x 2.5-3 mm. Surface reticulate-areolate, glossy, cinnamon-brown.** Native to the Himalayas, at altitudes 2700-3000 m; in the Carpathians rarely cultivated in parks, uniquely naturalized. Uk.

**2672. *Syringa josikaea*** Jacq. fil. — Shrub, up to 5 m high, with erect twigs, leaves elliptical or elliptic-oblongate, corolla purplish. **Fruits capsulae, oblong-elliptic, dorsal side convex, with 3-5 longitudinal ribs, ventral side concave, 8-9 x 2.3-2.7 mm. Surface reticulate-areolate, slight lustrous, brown.** Native to Transylvanian and the eastern Carpathian mountain zone, stony slopes and near rivers; also cultivated in parks and industrial areas. Mo, Ro, Sk, Uk.

**2673. *Syringa persica*** L. — Shrub, up to 250 cm high, with pedulous thin twigs and aromatic flowers. **Fruits capsulae, prolonged elliptic, dorsal side convex, with longitudinal rib, ventral concave, without rib, margin winged around, 8-9 x 2-2.3 mm. Surface fine reticulate-areolate, slight lustrous, dark-brown, wing pale-brown.** Native to China and Iran; in the Carpathians since old times rarely cultivated in parks and town verdure for its nice leaves and flowers. Hu, Mo, Ro, Sk, Uk.

**2674. *Syringa velutina*** Komar., *S. koehneana* Schneid. — Shrub, up to 3 m high. **Fruits capsulae, elliptic, strong flattish, surrounded with semimembranous wings, 9-11 x 2-3.2 mm. Surface fine, irregular reticulate-areolate, lustrous, cinnamon-brown, wings pale.** Native to northern China and

Korea; rarely cultivated in parks, gardens and town verdure.

**2675. *Syringa villosa*** Vahl. — Dense shrubs, up to 3 m high. **Fruits capsulae, prolonged elliptic, flattish, with three longitudinal ridges, in semimembranous cover, winged, 11-12 x 3-3.5 mm. Surface irregular reticulate-foveate, lustrous, cinnamon-brown, wings pale.** Native to northern China; in the Carpathians rarely cultivated in parks. Uk.

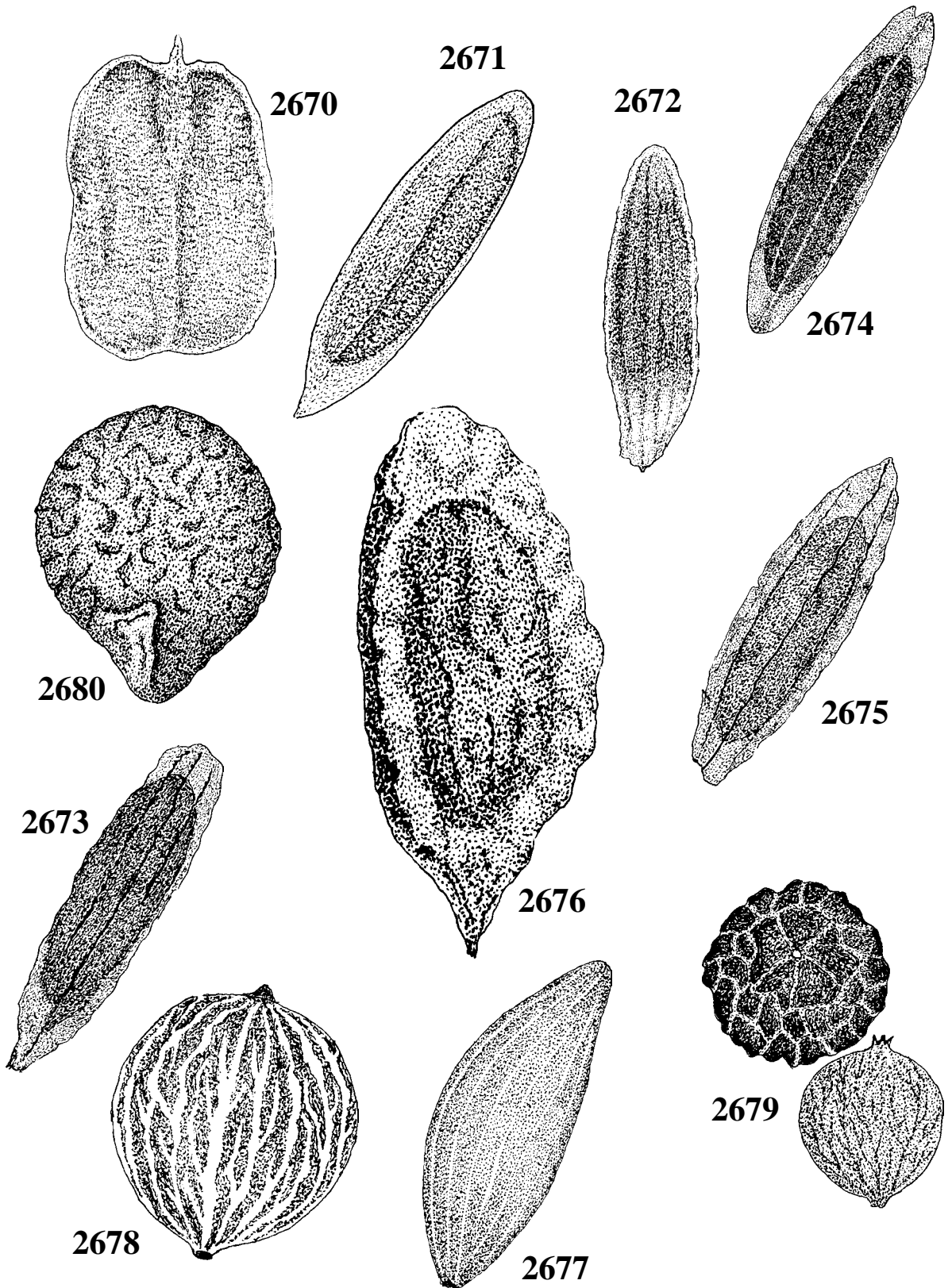
**2676. *Syringa vulgaris*** L. — Shrub, erect, seldom a tree, up to 7 m high, twigs bare. **Fruits capsulae, elliptic, strong flattish, membranous winged around, 8-9 x 3.5-4 mm. Surface rough, fine reticulate-foveate, ribbed, dark-brown, wing pale-brown. 2n = 44.** Native to southeastern Europe, since old times cultivated as an ornamental in many cultivars in parks, gardens and hedges; throughout the Carpathians.

**2677. *Chionanthus virginicus*** L. — Shrub or a small tree up to 10 m high, with a narrow, oblong corona and fragrant flowers. **Seeds oblong, narrowed at both ends, 10-20 x 5-8 mm. Surface with ribs and a dense net of veinlets, dirty-white.** Originally growing in North America; in the Carpathians commonly cultivated as a very attractive in parks and gardens.

**2678. *Phillyrea angustifolia*** L. — Shrub or a small tree up to 8 m high, twigs hirsute. **Seeds small stones, longitudinal striate, about 3.3-3.7 mm in diam. Surface light-brown to reddish-brown. 2n = 46.** Originally growing in the Mediterranean region and southwestern Asia, in maquis and forests; in the Carpathians cultivated as an ornamental in parks, in warmer areas.

**2679. *Phillyrea latifolia*** L. — Evergreen shrub or a small tree, up to 15 m high, with subfastigate branches when young, spreading later on, bark fine reticulate. **Fruits (down) 5-7 mm in diam. Surface black. Seeds (above) stones, globose, style caduceus, 4-5 mm in diam. Surface smooth, with a distinct venation, dull, pale-brown. 2n = 46.** Native to the western Mediterranean; in the Carpathians rarely cultivated in parks, in warmer areas.

**2680. *Jasminum fruticans*** L. — Shrub, evergreen or half-evergreen, up to 3 m high, ramified, twigs switched, acute-angular, glabrous. **Seeds semispherical, dorsal side convex, ventral flat or invaded, 5-6 x 4.2-4.8 mm. Surface rough, dull, glabrous,**



**brown to blackish-brown.** Native to the Mediterranean, Asia Minor and Persia, stony and rocky, shrubby places, forest margins, calcareous grounds; uniquely cultivated as a decorative shrub. Hu, Mo, Ro, Uk.

**2681. *Jasminum nudiflorum*** Lindley, *J. sieboldianum* Bl. — Deciduous shrub up to 5 m high, with recurved branches, leaves opposite. **Seeds oval or broadly obovate, lateral considerable compressed, bottom gradually narrowed, 5.8-6.2 x 4.4-4.8 mm. Surface wrinkly, dull, brown.** Native to China; in the Carpathians rarely cultivated for ornament in parks, locally naturalized.

**2682. *Osmanthus fragrans*** Lour. — Shrubs 1-2 m high or trees 5-6 m high, evergreen, leaves leathery, oblong or broadly elliptic up to lanceolate. **Seeds rounded with segmental circumference and large ellipsoid hilum, lateral slight compressed, 5-5.6 in diam. Surface smooth, lustrous, pale-brown.** Native to Himalayas, China, Japan; in the Carpathians very rarely cultivated as an attractive species in parks. Uk.

## 125. MENYANTHACEAE

**2683. *Menyanthes trifoliata*** L. — Perennial, robust, aquatic or semiaquatic bog plant with creeping stems, flowering stems 12-35 cm high, glabrous. **Seeds obovoid, ellipsoidal to spherical, slight flattish, 2.6-3.2 x 2-2.4 mm. Surface smooth, glabrous, glossy, reddish-brown. 2n = 54.** Native to Eurasia, marshy places, lake margins, bog meadows, shallow waters, from lowland up to mountain zones; throughout the Carpathians.

**2684. *Nymphoides peltata*** (S. G. Gmel.) O. Kuntze, *N. flava* Hill — Perennial, stems creeping or floating in water, up to 1.5 m long, glabrous. **Seeds obovoid, strong flattish, with many cilia on border, 5-6 x 4-4.7 mm. Surface fine waved, lustreless, greenish-white, greyish-brown. 2n = 54.** Native to Eurasia, in standing or slow-flowing waters of warmer areas; in all Carpathian territories.

## 126. GENTIANACEAE

**2685. *Centaurium erythraea*** Raf., *C. umbellatum* Gilib, *C. minus* Moench — Biennial, glabrous, stems erect, 10-50 cm high, simple, forkedly ramified above, 4-angular. **Seeds irregular spherical to ovoid, ellipsoid or angular, 0.2-0.3 x 0.2-0.3 mm. Surface rough to granular, slight lustrous, dark- to**

**reddish-brown. 2n = 40.** Native to Eurasia, dry grassland, scrub and mountain slopes, light forests and clearings, dry sandy soils; throughout the Carpathians.

**2686. *Centaurium littorale*** (Turner) Gilmour, *C. vulgare* Raf., *Erythraea vulgaris* Wittr. — Biennial, stems erect, single or in tufts, 5-25 cm high, angular, forkedly ramified above. **Seeds irregular shaped, spherical, ellipsoid, ovoid, angular, 0.5-0.6 x 0.3-0.4 mm. Surface smooth with distinct structure of the cells, glabrous, brown. 2n = 38 (40, 42, c. 56).** Native to Eurasia, maritime and inland saline soils and salt meadows. Hu, Mo, Pl, Ro, Sk, Uk.

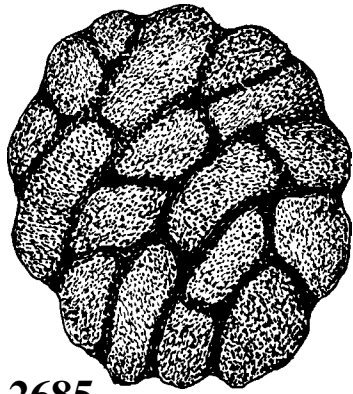
**2687. *Centaurium pulchellum*** (Swartz) Druce, *Erythraea pulchella* (Swartz) Fries — Annual, without basal leaf-rosette, stems forkedly ramified from the base. **Seeds irregular shaped, mostly obovoid to ellipsoid, 0.3-0.4 x 0.2-0.3 mm. Surface with wavy ribs, smooth, glabrous, slight lustrous or dull, brown. 2n = 20, 34, 36, 40, 54, 56.** Native to Eurasia, marshy places, dry rocky hillsides, clearings, as a weed in arable lands, abundant in saline soils; throughout the Carpathians.

**2688. *Centaurium spicatum*** (L.) Fritsch, *Erythraea spicata* Pers., *Gentiana spicata* L. — Annual, stem 4-angular, 10-50 cm high, with basal leaf-rosette. **Seeds irregular shaped, mostly obovoid, ovoid, ellipsoid up to angular, c. 0.3 x 0.2 mm. Surface slight waved, with distinct undulated cell walls, pale-brown.** Native to Eurasia and Africa, wet grassland, saline soils and sand dunes, as a weed in tilled areas. Mo, Ro, Uk.

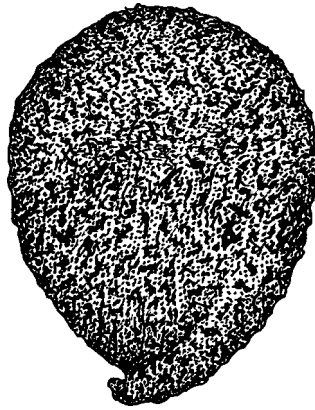
**2689. *Centaurium tenuiflorum*** (Hoffm. et Link) Fritsch — Annual, up to 20-40 cm high, stems with 5-9 internodes, branched above. **Seeds of various shapes and size, mostly globose, oval, c. 0.35 x 0.3 mm. Surface dense furrowed, lustrous, brown.** Native to southern and western Europe, damp grassy places, especially near seas. Mo.

**2690. *Centaurium uliginosum*** (Waldst. et Kit.) Beck, *Chitonia uliginosa* Waldst. et Kit. — Annual to biennial, stems cylindric, 10-20 cm high. **Seeds irregular shaped, prevallying spherical, ellipsoidal, 0.4-0.5 x 0.35-0.45 mm. Surface wrinkly, lustrous, glabrous, pale- to dark-brown.** Native to southern and western Europe, wet swampy and saline meadows, damp grassy places. Hu, Mo, Ro, Uk.

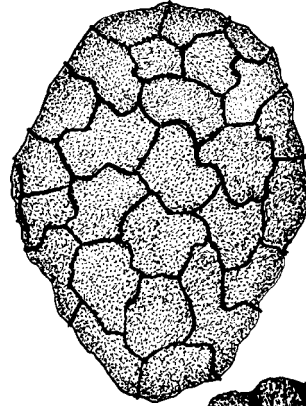




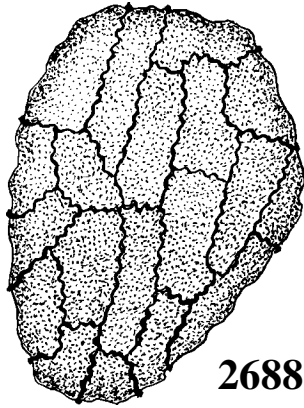
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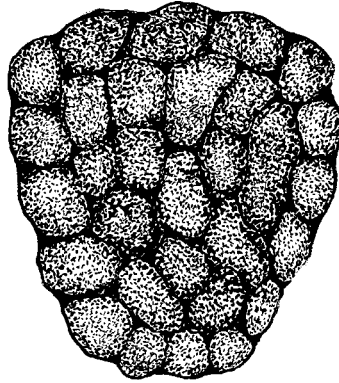
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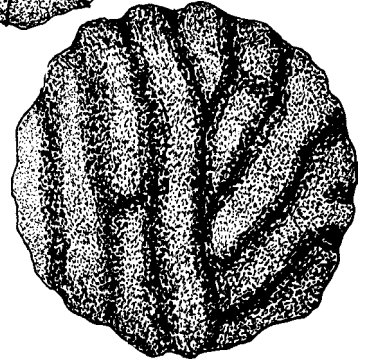
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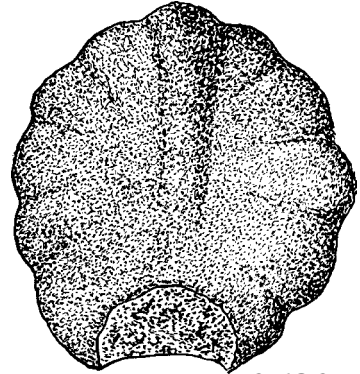
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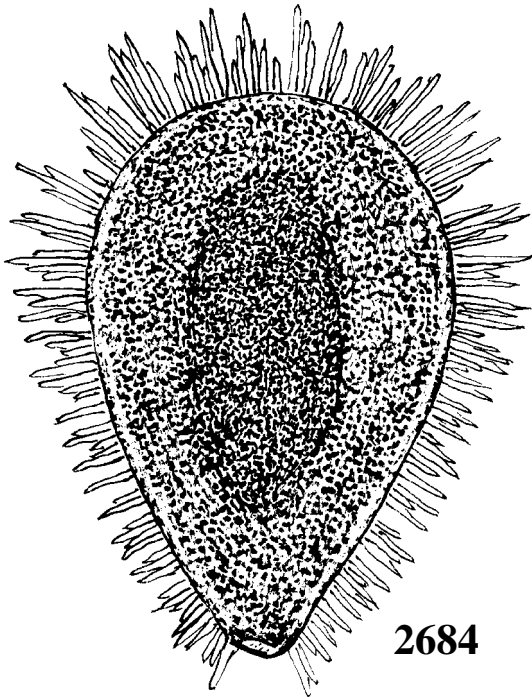
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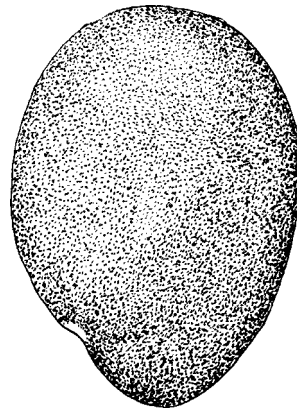
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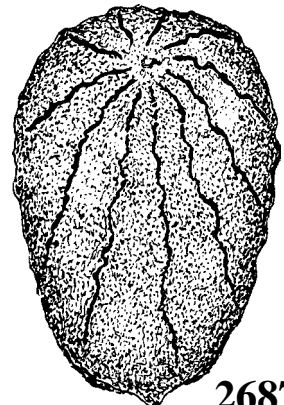
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**2691. *Gentiana asclepiadea* L., *Dasystephana asclepiadea* (L.) Bork.** — Perennial, tufted, stems aslant upright, unramified, densely leafy, 20-100 cm high. **Seeds ellipsoid to spherical, flattish, winged, 1.7-2.1 x 1.4-1.6 mm. Surface distinct reticulate, lustrous, glabrous, dark-brown, wing light-brown. 2n = 36 (44).** Native to the mountains of central Europe, damp or shady places, light woods, meadows and pastures. Hu, Pl, Ro, Sk, Uk.

**2692. *Gentiana cruciata* L., *Tretorhiza cruciata* (L.) Delarbre** — Perennial, stems tufted, from basal leaf rosette ascendent, rough, unramified, densely leafy. **Seeds ellipsoid to ovoid, base truncate, 1.1-1.3 x 0.5-0.6 mm. Surface glabrous, glossy, longitudinal dense ribbed, reddish-brown. 2n = 52.** Native to Eurasia, woodland margins, grasslands, shrubberies, mountain meadows, sunny places, from lowland up to subalpine zones; throughout the Carpathians.

**2693. *Gentiana decumbens* L.** — Low, perennial, stems 10-15 cm high, simple or in bunch, leaves lanceolate, flowers open blue. **Seeds cylindric, often slight bended, apex with small beak, bottom with rounded or ellipsoid hilum, 1.3-1.7 x c. 0.6 mm. Surface dense longitudinal ribbed, lustrous, brown.** Native to Siberia, woody mesophyt, resistant against sun radiance, cultivated in flower beds.

**2694. *Gentiana frigida* Haenke** — Perennial, stems erect, simple, 5-15 cm high, 1-3 flowers. **Seeds of various shapes, mostly prolonged, angular or rounded, 1.6-2 x 1.1-1.3 mm. Surface covered with longitudinal ribs and furrows, high glossy, glabrous, dark-brown. 2n = 24.** Native to the high mountains of Europe, moist stony places, screes, meadows, in alpine and nival zones, calcifuge grounds. Pl, Ro, Sk.

**2695. *Gentiana lutea* L.** — Perennial, stems erect, 50-140 cm high, simple, grooved, hollow. **Seeds ellipsoid to spherical, flattish with membranous wing, 4-4.6 x 2.8-3.2 mm. Surface glossy, glabrous, fine reticulate, dark-brown, wing pale-brown. 2n = 40.** Native to the Alps and the East Carpathians, semidry turfs, mountain pastures, alpine mats, light forests. Pl, Ro, Uk.

**2696. *Gentiana nivalis* L., *Calathiana nivalis* (L.) Delarbre** — Annual, stems 1-30 cm high, simple or branched, leaves ovate to elliptical. **Seeds ellipsoidal, lateral slight compressed, 0.8-0.9 x 0.3-0.4 mm. Surface reticulate, lustrous, dark-**

**brown to blackish. 2n = 14.** Native to Europe, at calcite stony mountain ridges. Pl, Ro, Sk.

**2697. *Gentiana orbicularis* (Schur) Holub, *G. brachyphylla* auct. non Vill.:** Schur — Perennial, stems from a rosette, erect, 3-15 cm high. **Seeds ellipsoidal, lateral slight compressed, 0.9-1 x 0.4-0.5 mm. Surface reticulate-areolate, bottom of areolas lustrous, dark-coffee. 2n = 48.** Native to Eurasia, meadows, pastures, mountain ridges, overgrown rocks, moist, often calcareous stands, in the alpine zone. Pl, Ro, Sk.

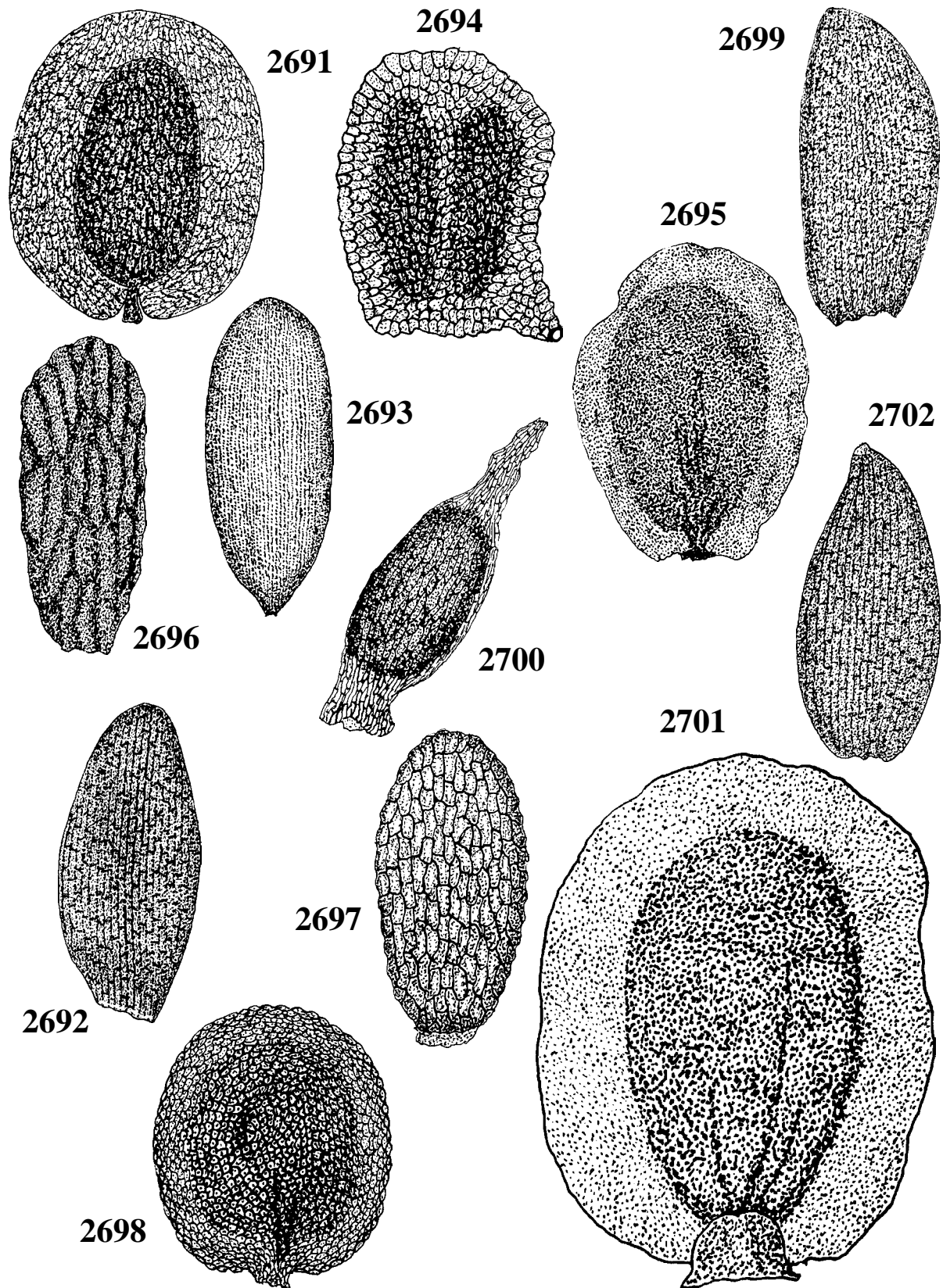
**2698. *Gentiana pannonica* Scop., *G. punctata* Jacq.** — Perennial, stems erect, rough, hollow, 40-70 cm high. **Seeds spherical or ellipsoidal, flattish, winged, 2.5-3 x 2-2.5 mm. Surface reticulate, glossy, glabrous, dark-brown, wing light-brown. 2n = 40.** Native to the mountains of central Europe, wet pastures and meadows, calcifuge of acid, humous soils, in the subalpine zone. Ro (?).

**2699. *Gentiana phlogifolia* Schott et Ky., *G. depressa* Schur.** — Perennial, stems 10-25 cm high, glabrous, procumbent, ascendent. **Seeds ellipsoidal, apex narrowed, base truncate, 0.9-1.2 x 0.5-0.6 mm. Surface longitudinal dense ribbed, glabrous, glossy, reddish-brown.** Native top Romania, grassy stony slopes, calcareous grounds, in the alpine zone. Ro.

**2700. *Gentiana pneumonanthe* L., *Dasystephana pneumonanthe* (L.) Soják** — Perennial, stems simple, slender, erect or ascending, without basal leaf rosette. **Seeds fusiform with a narrow wing, 1.3-1.5 x 0.4-0.5 mm. Surface longitudinal ribbed, glabrous, glossy, dark-brown, wing light-brown. 2n = 26.** Native to Eurasia, reed-beds, marshes, fens, peaty soils drying out in summer, calcifuge; throughout the Carpathians.

**2701. *Gentiana punctata* Scop.** — Perennial, stems erect, simple, glabrous, 20-60 cm high, hollow, weakly angular. **Seeds ellipsoid to spheroid, flattish, winged, 2.6-3.2 x 2-2.6 mm. Surface reticulate, lustrous, glabrous, dark-brown, membranous wing pale-brown. 2n = 40.** Native to the mountains of central Europe, stony meadows, plains and dwarf pine areas. Pl, Ro, Sk, Uk.

**2702. *Gentiana pyrenaica* L., *G. laciniata* Kit.** — Perennial, stems up to 10 cm high, simple ascending, densely leafy. **Seeds prolonged obovoid to ellipsoid,**



apex narrowed, base truncate, 1-1.2 x 0.5-0.6 mm. Surface longitudinal ribbed, glossy, glabrous, reddish-brown.  $2n = 26$ . Native to the higher mountains of Europe, grassy rocky slopes in the alpine zone. Pl.

**2703. *Gentiana septemfida*** Pallas — Perennial, stems up to 15 cm, procumbent, ascending, flowers with a fimbriate appendage in the sinus of the corolla, usually several flowers on the stem. **Seeds circular, with wing on apex, bottom truncate with large and deep hilum, 1.3-1.5 x 0.5-0.7 mm. Surface longitudinal furrowed, glossy, pale-brown.** Native to the Caucasian region; in the Carpathians commonly cultivated for ornament in rock-gardens.

**2704. *Gentiana utriculosa*** L. — Annual, stems erect, simple or branched, glabrous, 10-30 cm high, angular. **Seeds mainly ellipsoid, 0.7-0.8 x 0.3-0.4 mm. Surface reticulate-foveate, glabrous, lustrous, brown to blackish-brown.** Native to central Europe, grassy places and sunny calcareous slopes in the montane zone. Ro.

**2705. *Ciminalis acaulis*** (L.) Moench, *Gentiana kochiana* Perr. et Song. — Perennial, stems erect, 5-10 cm high. **Seeds ellipsoid, ovoid, obovoid, seldom globose, 1.2-1.5 x 0.7-0.8 mm. Surface rough, with longitudinal furrows and ribs, transversal undulated, dull, glabrous, brown.**  $2n = 36$ . Native to the Alps and Carpathians, forest steppes and semisteppe meadows in alpine and subalpine zones, a calcifuge. Ro, Uk.

**2706. *Ciminalis clusii*** (Perr. et Song.) Holub, *Ericoila clusii* (Perr. et Song.) Á. et D. Löve, *Gentiana clusii* Perr. et Song. — Perennial, stems erect, 1-10 cm high. **Seeds ovoid to ellipsoid, 1.6-1.9 x 0.8-1 mm. Surface rough, with longitudinal furrows and ribs of transversal undulation, dull, glabrous, brown.**  $2n = 36$ . Native to the Alps and Carpathians, calcareous, rocks and screes, stony grounds. Pl, Ro, Sk.

**2707. *Calathiana verna*** (L.) Holub, *Gentiana verna* L. — Perennial, stems from numerous leaf rosettes, erect, 2-20 cm high, one-flowered. **Seeds prolonged ovoid to ellipsoid, 0.8-1 x 0.5-0.6 mm. Surface reticulate, glabrous, lustrous, dark-brown or brown.**  $2n = 28$ . Native to Eurasia, meadows, pastures, overgrown rocks in the montane zones. Br, Pl, Ro, Sk, Uk.

**2708. *Swertia perennis*** L. — Perennial, stems erect, 4-angular, ramified only in inflorescence, 5-50 cm high, often violetish. **Seeds of irregular shape, mainly ellipsoid and spheroid, with broad wing, flattish, 1.7-2.1 x 1.5-1.8 mm. Surface reticulate, slight lustrous, glabrous, dark-brown, wing pale.**  $2n = 28$ . Native to northern and central Europe, wet places, mainly in montane and subalpine zones.

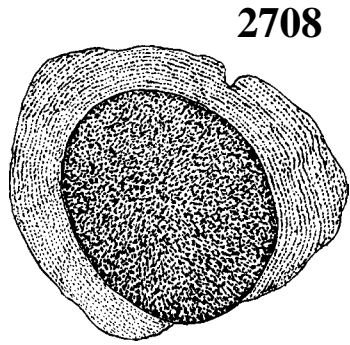
**2709. *Swertia punctata*** Baumg., *S. iberica* Fisch. ex C. A. Mey. — Perennial, stems simple, 13-35 cm high, erect, glabrous. **Seeds mainly elliptic, flattish, with broad wing, 2.2-2.6 x 1.6-1.9 mm. Surface reticulate, lustrous, glabrous, dark-brown, wing pale.** Native to the southern and eastern Carpathians and the Balkan Peninsula, peat alpine meadows, streamsides and scrubs. Pl, Ro.

**2710. *Gentianella amarella*** (L.) Börner, *Gentiana amarella* L. s. s. — Annual to biennial, stem erect, 5-30 (-50) cm high. Simple or ramified from base, twigs ascendent. **Seeds rounded to ellipsoid, 0.6-0.9 x 0.5-0.6 mm. Surface granulate, glabrous, lustrous, brown.**  $2n = 36$ . Native to Eurasia, meadows, shrubberies, clearings, spreading as far as the subalpine zone. Br, Pl, Ro, Sk, Uk.

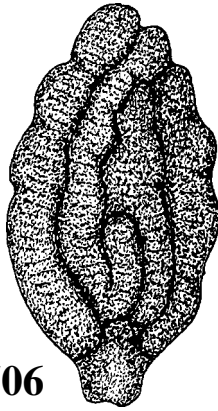
**2711. *Gentianella austriaca*** (A. et J. Kerner) Holub, *Gentiana austriaca* A. et J. Kerner — Biennial, stems 10-40 cm high, usually branched from the base, forming a corymbose inflorescence. **Seeds globose or slight ellipsoid, 6-7 x 4.5-5.5 mm. Surface granulate, faint lustrous, pale-brown.** Native to eastern and central Europe, moist lawns in montane and subalpine zones. Hu, Pl, Ro, Sk.

**2712. *Gentianella campestris*** (L.) Börner, *Gentiana campestris* L. — Annual to biennial, stems erect, simple or ramified, 3-30 cm high, twigs erect. **Seeds spheroid, ellipsoid to ovoid, 0.7-0.9 x 0.6-0.8 mm. Surface granulate, glabrous, slight lustrous, yellowish-brown.**  $2n = 36$ . Native to northern and central Europe, meadows, grassy slopes and heaths, neutral and acid grounds. Pl, Ro.

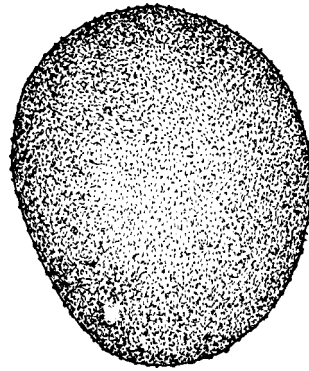
**2713. *Gentianella germanica*** (Willd.) Börner, *Gentiana germanica* (Willd.) Br.-Bl. — Biennial, stem simple or ramified, 15-30 cm high. **Seeds spheroid, ovoid or obovoid, ellipsoidal, 0.6-0.8 x 0.5-0.7 mm. Surface fine granulate, glabrous, slight lustrous, yellowish- to greyish-brown.**  $2n = 36$ . Native to western and central Europe, meadows, pastures, peats, stony, neutral and basic grounds. Ro, Sk.



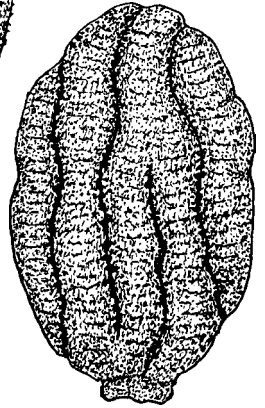
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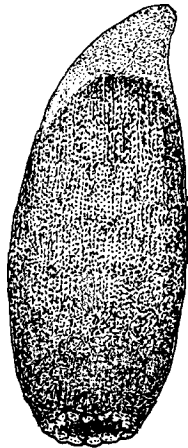
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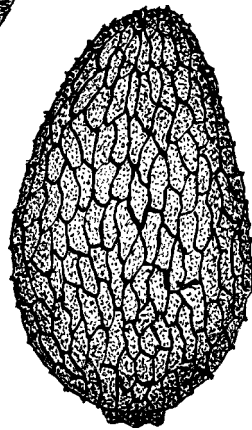
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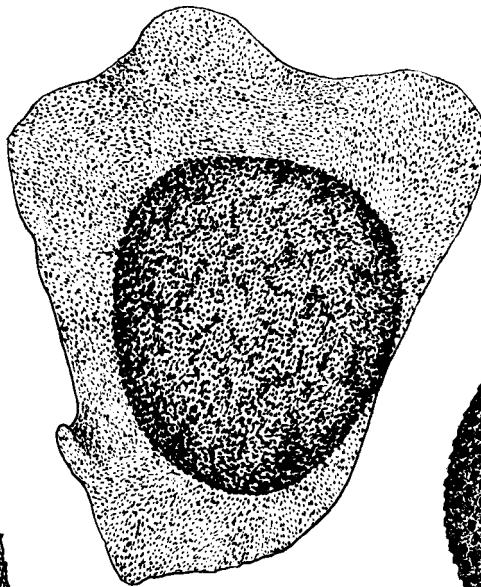
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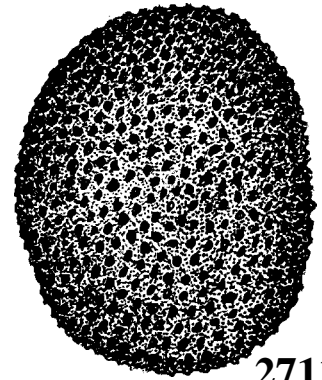
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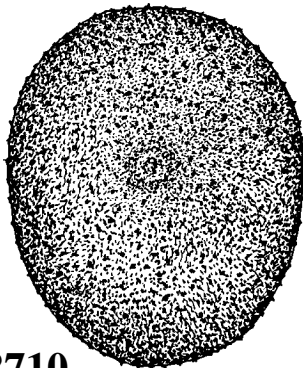
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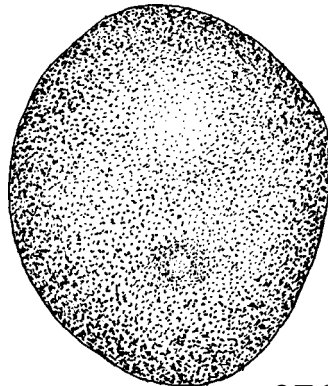
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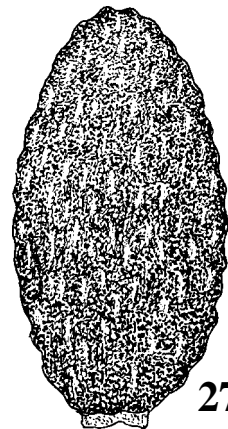
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**2714. *Gentianella lutescens*** (Velen.) Holub, *Gentiana lutescens* Velen. — Biennial, stem 3-40 cm high, simple or ramified above. **Seeds globose, ellipsoid or ovoid, 0.5-0.8 x 0.4-0.7 mm. Surface granulate, glabrous, lustrous, yellowish- to dark-brown. 2n = 36.** Native to central Europe and the Balkan territory, meadows, pastures, light forests, calcareous grounds, mainly in mountains. Pl, Ro, Sk, Uk.

**2715. *Gentianella uliginosa*** (Willd.) Börner, *Gentiana uliginosa* Willd. non Murb. — Annual to biennial, stem 1-15 cm high, 1-2 flowers from leaf axils. **Seeds spherical to ellipsoidal, or irregular, 0.8-0.9 x 0.6-0.7 mm. Surface granulate, glabrous, yellowish. 2n = c. 54.** Native to northern and central Europe, wet and swampy meadows, heaths, sandbanks, river- and brookbanks.

**2716. *Blackstonia acuminata*** (Koch et Ziz.) Domin, *B. serotina* (Koch) Beck — Annual, stems usually slender, up to 10-30 cm high, non- or poorly ramified. **Seeds irregular, mostly ellipsoid and rectangular, 0.4-0.5 x 0.2-0.3 mm. Surface glabrous, tuberculate, dull, dark-brown to black. 2n = 40.** Native to the Mediterranean, lowland streamsides, dune slacks, damp slopes, peat meadows. Hu, Ro, Sk, Uk.

**2717. *Blackstonia perfoliata*** (L.) Huds., *Chlora perfoliata* (L.) L. — Annual, a glabrous, glaucous, hoarfrosty plant, stems erect, 10-50 cm high, rounded, unramified. **Seeds reniform, ellipsoidal, ovoidal, rectangular, etc., 0.4-0.5 x 0.1-0.2 mm. Surface verrucate, glabrous, lustrous, dark- to blackish-brown. 2n = 40.** Native to the Mediterranean, damp places, rather rare in forests, roadside verges, grassy banks, streamsides. Ro, Uk.

**2718. *Gentianopsis ciliata*** (L.) Ma, *Gentiana ciliata* L., *Gentianella ciliata* (L.) Borkh. — Biennial (perennial), up to 5-30 cm high, stem erect, 4-angular, simple or poorly branched, 1 or few flowers. **Seeds ellipsoid or irregular shaped with wing around the seed, 0.7-0.8 x 0.2-0.3 mm. Surface glabrous, lustrous, with longitudinal striate, light-brown, wing light-brown. 2n = 14.** Native to central and southern Europe, moist grassy places, forests and shrubberies. Hu, Mo, Pl, Ro, Sk, Uk.

## 127. APOCYNACEAE

**2719. *Vinca minor*** L. — Perennial, stems procumbent or ascendent, woody at base, 15-20 cm long, evergreen. **Seeds cylindric, with deep longitudinal**

**furrow on ventral side, 6.5-7.5 x 2-2.4 mm. Surface dense humpy, glabrous, dull, dark-brown. 2n = 46.** Native to Eurasia, light woods and shrubberies, overgrown rocks and vineyards; often cultivated in gardens, parks and cemeteries; throughout the Carpathians.

**2720. *Vinca major*** L. — Perennial, stems up to 1 m high, ascendent, archy inclined and procumbent from the base, evergreen. **Seeds prolonged ellipsoid, dorsal side convex, ventral with shallow longitudinal furrow, 8.5-9.5 x 2.3-2.7 mm. Surface with numerous longitudinal ribs, humpy, lustreless, dark-brown. 2n = 92.** Native to Eurasia; rarely cultivated in gardens and cemeteries.

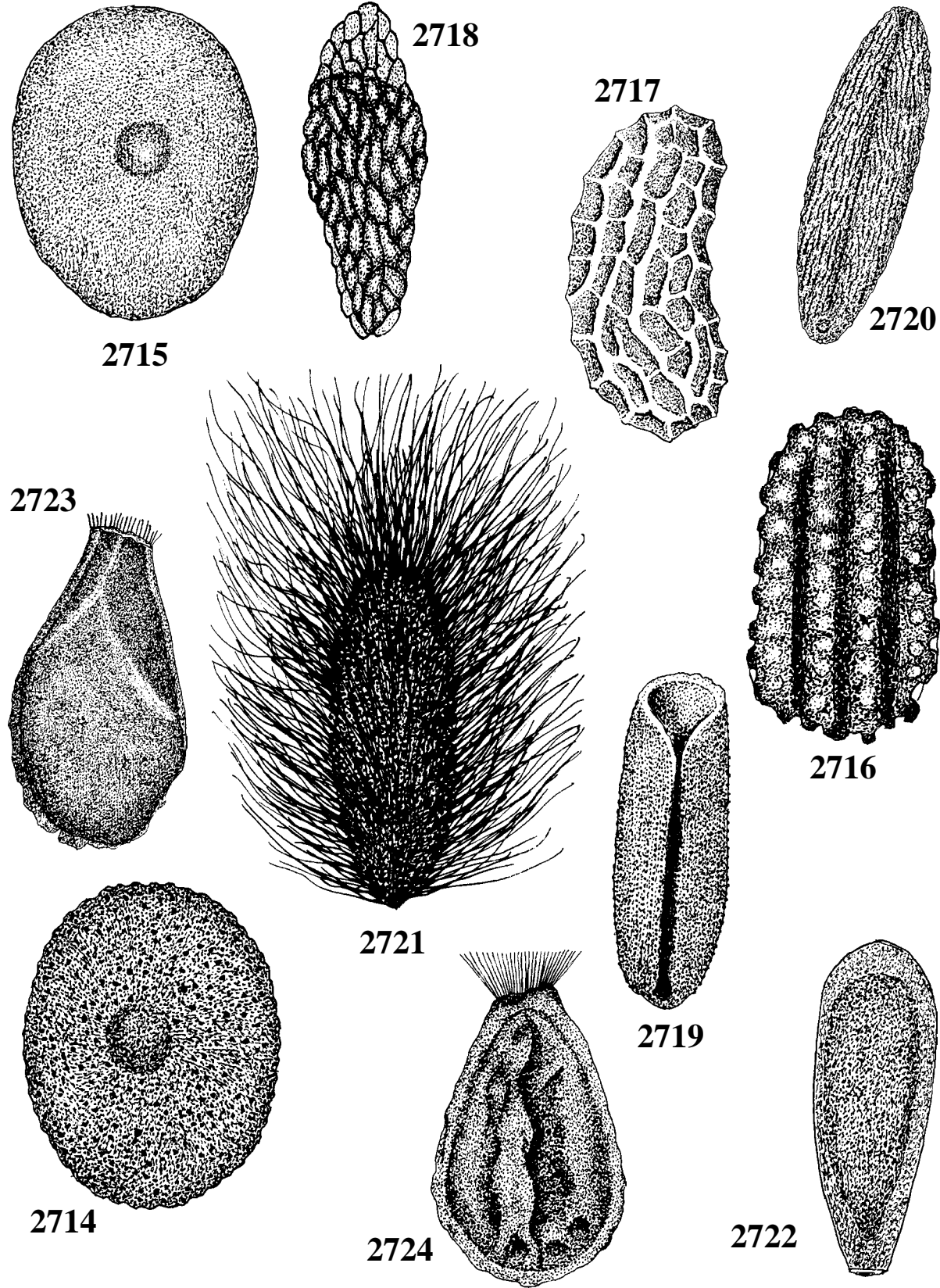
## 128. ASCLEPIADACEAE

**2721. *Nerium oleander*** L. — Treelet up to 4 m high with evergreen leaves. **Seeds prolonged ellipsoid, 5-7 x 2-2.5 mm. Surface dense covered with long bristles, brown or pale-brown. 2n = 16, 22.** Native to the Mediterranean, cultivated on riverbanks and river gravels; in the Carpathians, in gardens, parks, interiors, as an ornamental, non-resistant against frost.

**2722. *Vincetoxicum acutum*** L., *Cynanchum acutum* L. — Perennial, stems voluble, glabrous or hirsute on knobs. **Seeds ovoidal, dorsal side convex and hem in round with a wing, ventral side concave with a rib in the middle, 7-9 x 2.6-3 mm. Surface faint wrinkly, dull, glabrous, brown. 2n = 18.** Native to southern Europe and southwestern Asia, loamy slopes, sandy dunes, saline soils, reeds, fields. Mo, Ro, Uk.

**2723. *Vincetoxicum fuscatum*** (Hornem.) Rchb. fil., *Cynanchum fuscatum* Link. — Perennial, up to 20-40 cm high, stems erect, non-twining, puberulent. **Seeds ovoid, dorsal side convex, ventral concave with a rib in the middle, apex with pappus of hairs, 5.4-6 x 2.9-3.3 mm. Surface smooth, hem on the border chocolate brown.** Native to southeastern Europe. Ro, Uk.

**2724. *Vincetoxicum hirsutaria*** Medik., *V. officinale* Moench, *Asclepias vincetoxicum* L. — Perennial, stems erect, 20-120 cm high, simple, rounded, puberulent or subglabrous. **Seeds ovoidal or oval, flattish, apex truncate with pappus (c. 1.5 cm long) of fine hairs, base rounded, 5-6 x 2.8-3.2 mm. Surface dull, glabrous, wrinkly, rusty-brown. 2n = 22, 44.** Native to Eurasia, sunny grassy and shrubby slopes, forest steppes, sandy clay and calcareous rocks; throughout the Carpathians.





**2725. *Vincetoxicum nigrum*** (L.) Moench, *Cynanchum nigrum* (L.) Pers. non Cav. — Perennial, up to 40-80 cm, mostly twining, puberulent. **Seeds ovoid or oval, compressed, apex truncate, with pappus of hairs, dorsal side convex, ventral concave, 7-8 x 3.7-4.2 mm. Surface chocolate brown, with small dark-brown spots, lustreless, smooth, with hem around the seeds.** Native to southwestern Europe; rarely cultivated in parks and naturalized in the Carpathians. Ro.

**2726. *Vincetoxicum pannonicum*** (Borhidi) Holub, *Cynanchum pannonicum* Borhidi — Perennial, up to 20-40 cm high, stems erect, puberulent, flowers yellow, reddish-brown hemmed. **Seeds ovoidal, flattish, with pappus of fine hairs, dorsal side convex, ventral concave with ribs up to 1/2 of the seed, 6-7 x 4-4.6 mm. Surface granulate, dull, glabrous, dark-brown, hilum whitish. 2n = 44.** Endemic to Pannonia, dry grasslands and crevices, calcareous rocks, stony places, scrubs and steppes. Hu, Uk.

**2727. *Vincetoxicum rossicum*** (Kleopov) Barbarich, *Antitoxicum rossicum* Kleopov — Perennial, up to 150 cm high, stems twining, puberulent. **Seeds ovoidal, dorsal side convex, ventral concave with a rib in the middle, with hem on the border, apex with pappus of hairs, 5.2-5.6 x 2.7-3 mm. Surface smooth or rough wrinkly, chocolate brown.** Native to southeastern Europe, dry stony places, scrubs and steppes. Uk.

**2728. *Vincetoxicum scandens*** Sommier et Levier, *Antitoxicum scandens* (Sommier et Levier) Pobed. — Perennial, stems up to 2 m high, twining, puberulent. **Seeds ovoidal, dorsal side convex, ventral concave with longitudinal rib in the middle, surround with a narrow wing, hairy-brush on apex, 6.5-7.5 x 3.7-4.3 mm. Surface wrinkly, dull, chocolate-brown.** Native to southeastern Europe leafy woodlands, scrubs, forest margins. Uk.

**2729. *Asclepias syriaca*** L., *A. cornuti* Decne. — Perennial, a glaucous, milking plant, stems erect, 1-1.5 m high. **Seeds ovate, flattish, dorsal side convex, ventral flat with faint distinct rib in the middle, whole seed surround with waved wing, pappus of hairs (30-50 mm long) on apex, 6-8 x 4-5 mm. Surface reticulate, glabrous, dull, brown, wing reddish-brown. 2n = 22, 44.** Originally growing in North America; rarely cultivated as a honey-bearing plant and also as a textile plant long ago, naturalized in the Carpathians. Hu, Mo, Pl, Ro, Sk, Uk.

**2730. *Periploca graeca*** L. — Liana, stems up to 12 m high, twining. **Seeds prolonged cylindric, dorsal side longitudinal fine furrowed, ventral side concave with a rib in the middle, apex with pappus of hairs c. 11 mm, base with a wing, 10-12 x 2.5-3 mm. Surface dull, brown. 2n = 24.** Native to southern, eastern and southwestern Europe, in lowland damp woods, river valleys, shrubberies, rarely on rocky places, mainly calcareous grounds. Au, Hu, Mo, Ro, Uk.

**2731. *Hoya carnosa*** (L. fil.) R. Br., *Asclepias carnosa* L. fil. — Shrub with twining twigs, ramified, glabrous, with bunch of white flowers. **Seeds shovel-shaped, dorsal side convex, ventral concave with furrow in the middle, apex with the pappus of yellowish hairs (2 cm and more), 4.7-5.2 x 1.6-1.8 mm. Surface, smooth, dull, glabrous, violetish-brown.** Originally growing in eastern Asia; cultivated as a room flower in pots.

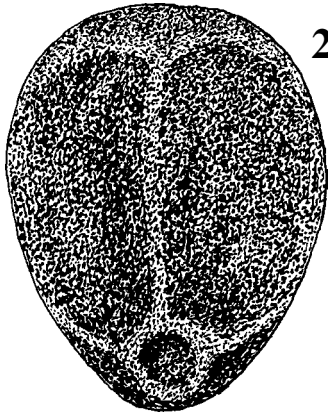
## 129. CONVOLVULACEAE

**2732. *Convolvulus arvensis*** L. — Perennial, a bare or scattered downy plant, stems procumbent, up to 1 m long, ramified, blunt 6-angular. **Seeds obovoid, slight trigonous, dorsal side convex, two ventral areas flat, base with rounded hilum, 3-4 x 2.2-3 mm. Surface mammiform, rough, dull, greyish-brown. 2n = 48.** Native to the Mediterranean, a cosmopolitan at present, a weed of fields, gardens, roadsides, pastures, vineyards, in all types of soils; throughout the Carpathians.

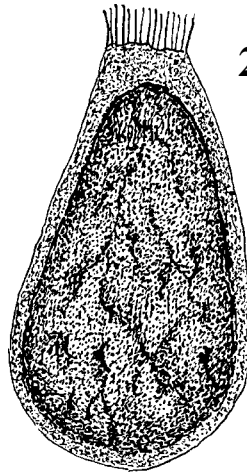
**2733. *Convolvulus cantabrica*** L. — Perennial, stems and leaves glossy, lanate hairy, stems procumbent, ascendent or erect, 20-40 cm, ramified or simple. **Seeds obovoid, trigonous, dorsal side convex, two ventral areas rooflike and flat or concave, base with rounded hilum, 2.6-3 x 2.3-2.6 mm. Surface velvety hairy or pubescent, dull, glabrous, dark-brown. 2n = 30.** Native to Eurasia, sunny, dry stony slopes. Hu, Mo, Ro, Sk, Uk.

**2734. *Convolvulus elegantissimus*** Mill., *C. althaeoides* Mill., *C. tenuissimus* Sibth. et Sm. — Perennial, stems 30-100 cm long, prostrate, hirsute, with dense, almost entirely appressed hairs, voluble. **Seeds trigonous, dorsal side convex, two ventral sides rooflike and flat or concave, 3-3.5 x 2.7-3 mm. Surface papillose-verrucate, dull, brownish-black.** Native to the Mediterranean, eastwards of Italy, stony coastals, shrubberies, calcareous stands. Ro.

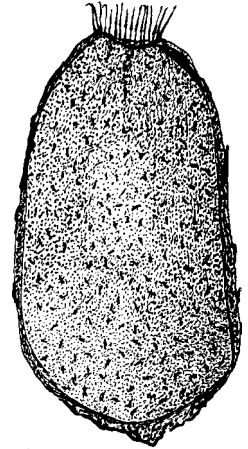




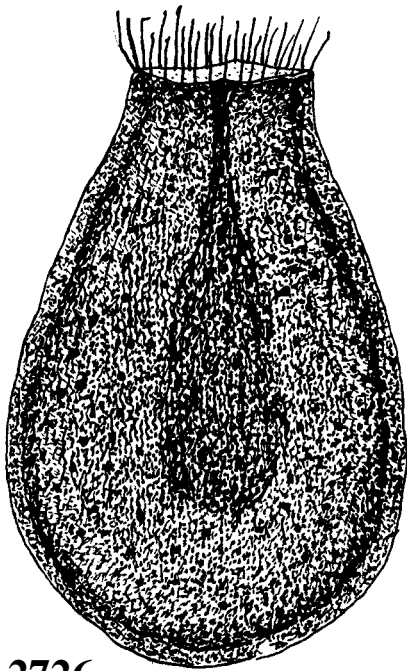
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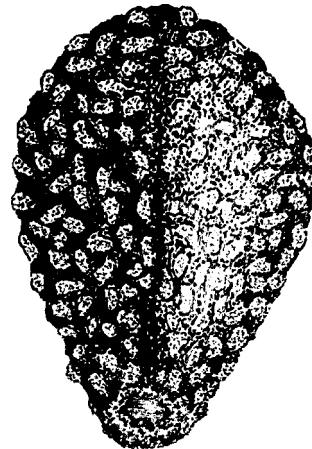
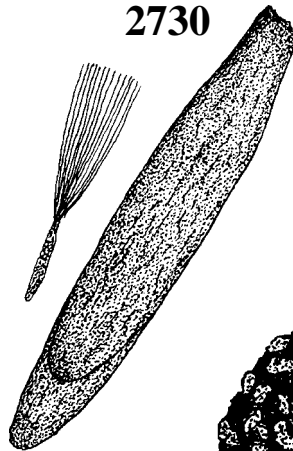
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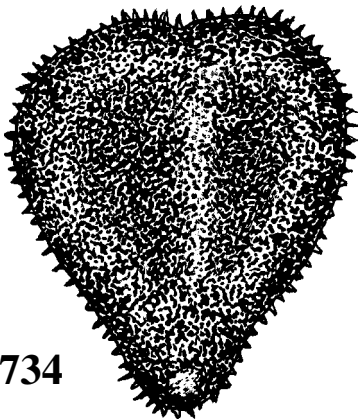
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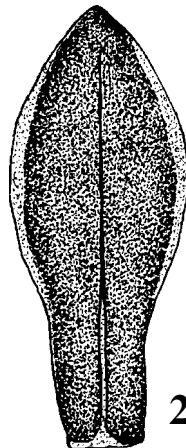
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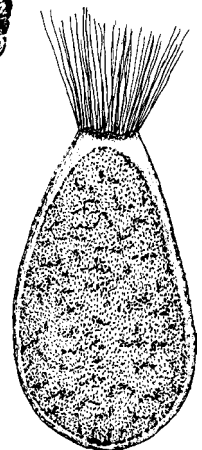
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**2735. *Convolvulus lineatus* L.** — Perennial, stems 10-20 cm high, with ascendent twigs. **Seeds trigonous, dorsal side convex, two ventral sides rooflike and flat, base with spherical hilum, 2.5-2.9 x 2.1-2.5 mm. Surface velvety hairy, dull, greyish-brown.** Native to the Mediterranean and Asia Minor, steppes, rocky slopes, bare banks, streamsides, dry pastures, fallow-lands. Mo, Ro, Uk.

**2736. *Convolvulus persicus* L.** — Perennial, plant robust, densely lanate, stems 10-50 cm high, with creeping woody stock and stout, erect, simple or sparingly branched. **Seeds spherical, with large and deep hilum at the bottom, 4.8-5.4 x 4.5-5 mm. Surface low papillose-tuberculate, dull, greyish-brown.** Native to the western coast of the Black Sea, on maritime sands. Ro.

**2737. *Convolvulus tricolor* L.** — Annual, a plant up to 40 cm high, pubescent, stems ramified, erect or prostrate, with ascendent twigs. **Seeds quadrangular, dorsal side convex, three ventral sides rooflike and flat, 3-3.3 x 2.7-3.1 mm. Surface whitish tuberculate, dull, glabrous, dark-brown.** Originally growing in Brazil, naturalized in the Mediterranean; in Europe often cultivated for ornament, sometimes escaping from gardens and naturalized. Hu, Ro, Sk.

**2738. *Calystegia sepium* (L.) R. Br., *Convolvulus sepium* L.** — Perennial, stems 100-200 cm high, consequently twining, branched. **Seeds obovate, dorsal side convex, two ventral sides rooflike, flattish or concave base narrowed, with large round hilum, 4.8-5.2 x 3.3-3.7 mm. Surface globulate, dull, dark-brown to blackish, hilum pale-brown. 2n = 22, 24.** Submediterranean element, lowland forests, coastal shrubberies, reeds, moist ruins, stony soils; throughout the Carpathians.

**2739. *Calystegia soldanella* (L.) R. Br., *Convolvulus soldanella* L.** — Perennial, stems ramified, procumbent, glabrous. **Seeds trigonous, ovoid, dorsal side convex, two ventral sides rooflike, flat, base with distinct large and round hilum, 5.5-6.5 x 4.5-5.5 mm. Surface velvety hairy, dull, glabrous, dark-grey or greyish-brown.** Native to Eurasia, sands and sandy dunes of sea shores with temperate climate. Ro.

**2740. *Calystegia sylvatica* (Waldst. et Kit.) Choisy, *C. sylvestris* (Willd.) Roem. et Schult.** — Perennial, a glabrous plant, 3-4 m long, stems richly leafy, procumbent. **Seeds of special shape, apex rounded,**

**base narrowed and also rounded with large yellow hilum, 4.6-5.4 x 3.7-4.3 mm. Surface dense humpy, dull, glabrous, dark-brown, sockets on ventral side yellowish.** Native to southern Europe, woods and shrubberies. Hu, Ro.

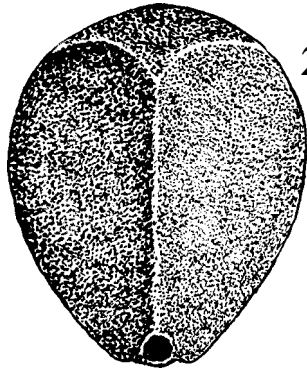
**2741. *Ipomoea hederacea* Jacq., *Pharbitis hederacea* (L.) Choisy, *Convolvulus hederaceus* L.** — Annual, plant hispid, ascending, up to 2-3 m long, leaves trilobate. **Seeds trigonous, dorsal side convex, two ventral sides rooflike, concave or flat, 4.5-5 x 3.8-4.2 mm. Surface covered with very short hairs, dull, black.** Native to Brazil; in the Carpathians cultivated as an ornamental in gardens, in many cvs.

**2742. *Ipomoea purpurea* Roth, *Pharbitis purpurea* (Roth) Voigt** — Annual, stem twining, up to 3 m long, ramified, bristly hirsute. **Seeds trigonous, dorsal side convex with a broad patch in the middle, two ventral sides rooflike and flat, 4.4-4.8 x 3.2-3.6 mm. Surface velvety hairy or smooth, dull, glabrous, brownish-black. 2n = 30.** Originally growing in Central America; cultivated in gardens and parks, transiently naturalized. Hu, Mo, Ro, Sk, Uk.

**2743. *Ipomoea violacea* L., *I. tricolor* Cav., *Pharbitis rubro-coerulea* (Hook.) Choisy** — Perennial, a voluble, climbing plant, stems 3-4 m long. **Seeds trigonous, dorsal side convex, two ventral sides rooflike and flat, 6.4-7 x 3.8-4.2 mm. Surface velvety hairy or smooth, dull, brownish-black to black.** Originally growing in Mexico; introduced into Europe and cultivated as an ornamental. Hu, Ro, Uk.

**2744. *Quamoclit coccinea* (L.) Mnch., *Ipomoea coccinea* L.** — Annual, stems slender, climbing up to 4-5 m high. **Seeds trigonous, dorsal side convex with one or two furrows in the middle, two ventral sides rooflike and flat, 3.4-4 x 2.9-3.2 mm. Surface velvety hairy or smooth, dull, glabrous, black.** Native to tropical America; cultivated as an ornamental in gardens. Ro.

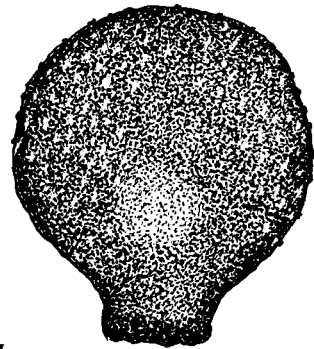
**2745. *Quamoclit vulgaris* (L.) Choisy, *Ipomoea quamoclit* L.** — Annual, stems slender, climbing. **Seeds trigonous, dorsal side convex with a broad furrow in the middle, two ventral sides rooflike and flat, 3.3-3.7 x 2.6-3 mm. Surface velvety hairy or smooth, dull, glabrous, blackish.** Originally growing in east India; cultivated as an ornamental in gardens. Ro.



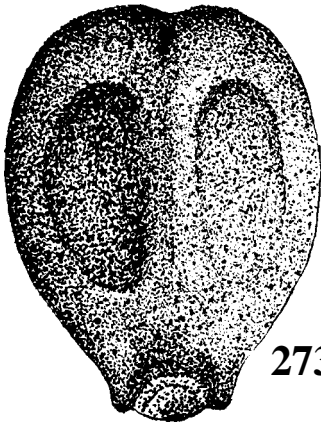
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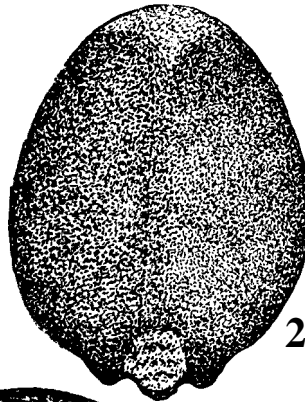
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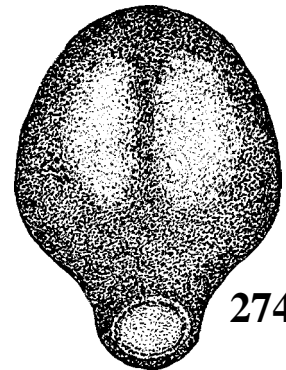
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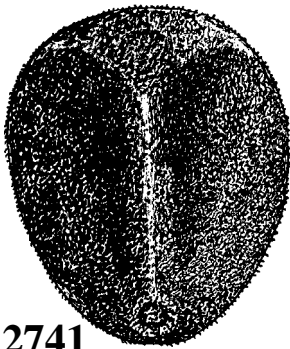
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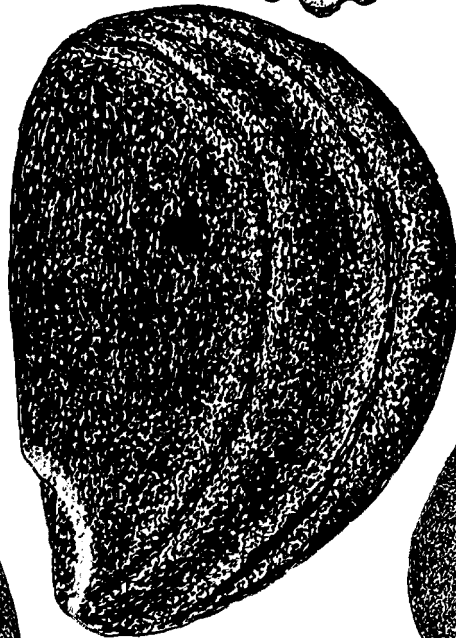
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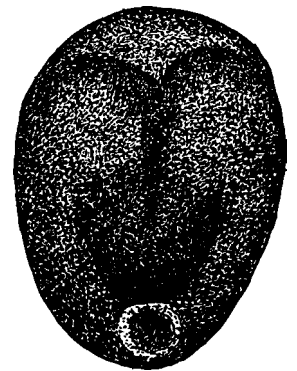
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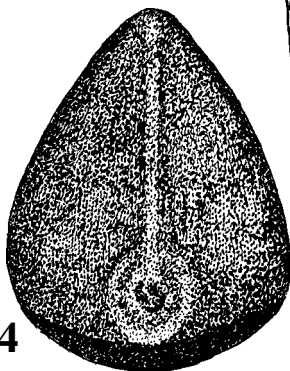
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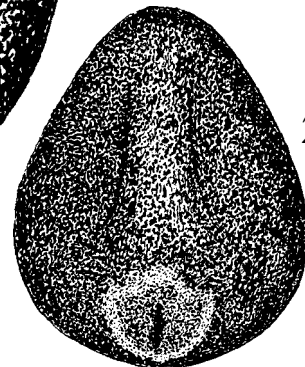
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## 130. CUSCUTACEAE

**2746. *Cuscuta approximata*** Babingt., *C. planiflora* Schmalh., *C. cupulata* Engelm. — Annual, shoots filiform, moderately stout, up to 0.9 mm wide, yellowish, brown or greenish. **Seeds obovoidal, angular-globose, dorsal side convex, two ventral sides flat, hilum large, rounded, 0.8-0.9 x 0.6-0.7 mm. Surface fine reticulate-foveate, dull, light-grey up to brown.** Native to Europe and Asia Minor, on various species of herbs and shrublets in irrigated and fallow fields. Mo, Ro, Uk.

**2747. *Cuscuta epilinum*** Weihe ex Boenn. — Annual, stems slender, 30-50 cm, unramified. **Seeds irregular globose or oval, obovoidal, narrowed as a rule at base, often two glued together, contact side flattish, 1.2-1.4 x 1-1.2 mm. Surface reticulate-foveate, dull, greenish- or yellowish-grey to brown.** Native to Eurasia, except the extreme north, a parasitic plant thriving mainly on *Linum usitatissimum* and other species of *Linum*. Hu, Mo, Pl, Ro, Sk, Uk.

**2748. *Cuscuta epithymum*** (L.) Murr., *C. intermedia* Schur, *C. equiseti* Schur — Annual to biennial, stems slender, much ramified, 20-60 cm, often reddish. **Seeds ovoid to irregular suborbicular ellipsoid, dorsal side convex, ventral rooflike, slight flattish, 0.9-1.1 x 0.7-0.9 mm. Surface scabrous, dull, yellowish, grey or brown. 2n = 14.** Native to Eurasia, a parasitic plant thriving on numerous species of the family *Fabaceae* and other families, in open low formations, sometimes in fields on leguminous crops. Hu, Mo, Pl, Ro, Sk, Uk.

**2749. *Cuscuta europaea*** L., *C. major* DC., *C. viciae* Koch — Annual, stem rough, richly ramified, twining, 30-150 cm long, often reddish. **Seeds in outline: nearly spheroid or obovoid, dorsal side convex, two ventral sides rooflike and flat, hilum rounded and large, 1.1-1.3 x 0.9-1.1 mm. Surface scabrous, dull, greyish- or dark-brown. 2n = 14.** Native to Eurasia, lowland wet forests and shrubberies, as a parasite of numerous species of herbal and woody plants; through the Carpathians.

**2750. *Cuscuta pentagona*** Engelm., *C. arvensis-pentagona* Engelm. — Annual, shoots filiform, slender, 0.5-1 mm wide, ramified, orange. **Seeds subglobose to ellipsoid, dorsal side convex, two ventral sides concave, 1.8-2.4 x 1.5-1.8 mm. Surface whitish globulate, dull, yellowish- to dark-brown.** Native to southern Europe, a parasitic plant thriving on numerous ruderal species. Ro.

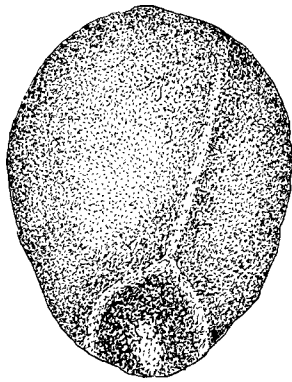
**2751. *Cuscuta planiflora*** Ten. — Annual, up to 2-3 m high, stems slender, rosette orange, much branched. **Seeds obovoid to ellipsoid, dorsal side convex, ventral slight rooflike, hilum in the bottom part globose, 0.8-0.9 x 0.65-0.75 mm. Surface reticulate-foveate, slight glabrous, pinkish-brown.** Native to southern Europe, a parasitic plant thriving on dwarf-shrubs and annuals. Hu, Ro.

**2752. *Cuscuta trifolii*** Bab. et Gibson, *C. epithymum* subsp. *trifolii* (Bab. et Gibson) Berger — Annual, an overwintering up to persistent parasitic weed with twining shoots, 1 meter and more long. **Seeds obovoid, spherical or of irregular shape, ± flattish on ventral side, often with a depression, 0.6-1 x 0.6-0.8 mm. Surface dull, scabrous, fine foveolate, yellowish-grey, greyish- to dark-brown.** Native to Mediterranean, a cosmopolite at present, thriving mostly on *Trifolium pratense*, from lowland up to the mountain areas, through the Carpathians.

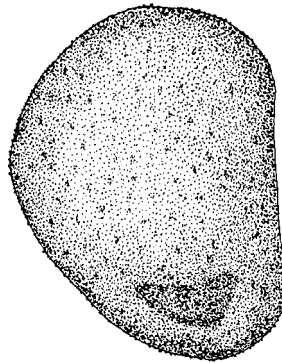
**2753. *Grammica campestris*** (Yuncker) Hadač et Chrték, *Cuscuta arvensis* R. Br. — Annual, shoots filiform, moderately stout, c. 0.8 mm wide, rough, yellowish, ramified, 20-50 cm long. **Seeds irregular spherical, dorsal side convex, ventral more or less flattish, 1.1-1.3 x 0.9-1.1 mm. Surface fine scabrous, dull, yellowish-grey or brown, hilum whitish. 2n = 56.** Originally growing in North America; hauling into lucerne and clover, seldom sugar-beet fields and other plant species. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**2754. *Grammica gronovii*** (Willd. ex Schult.) Hadač et Chrték, *Cuscuta americana* L. p. p. — Annual, stems rough, 50-200 cm long, bright-orange. **Seeds obovoid to ellipsoid, dorsal side convex, ventral concave with hilum on outline, 1.6-2 x 1.5-1.7 mm. Surface reticulate-foveate, dull, dark-brown. 2n = 60.** Originally growing in North America; occasionally hauling into the Carpathians and parasiting mainly on *Salix*, *Populus* and other trees, especially on riverbanks. Pl, Sk, Uk.

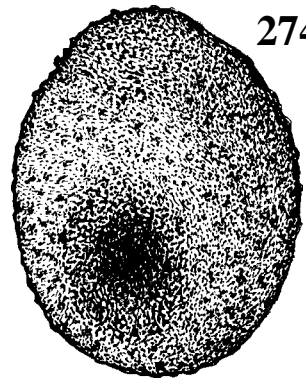
**2755. *Grammica scandens*** (Brot.) Holub, *Cuscuta australis* R. Br. — Annual, stems filiform, slender, moderately stout, ramified, 20-50 cm long, yellowish to orange. **Seeds obovoid to ellipsoid or globose, dorsal side convex, ventral often concave with rounded hilum, 1.4-1.6 x 1.1-1.3 mm. Surface fine reticulate-foveate, dull, pale- to dark-brown.** Native to southern Europe, parasiting on genus *Poly-*



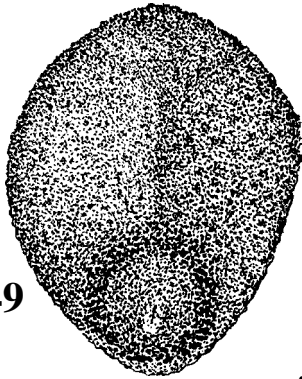
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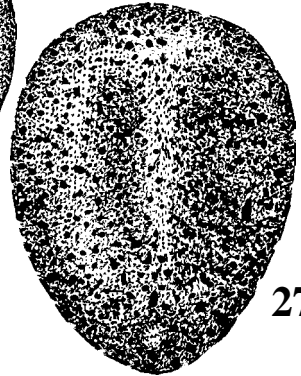
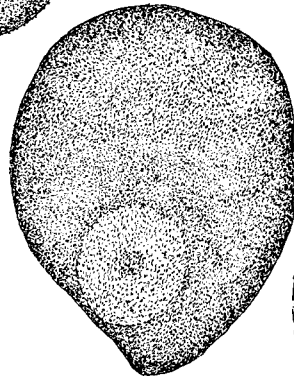


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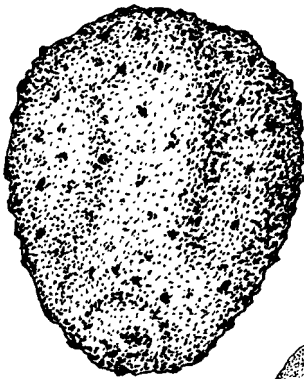


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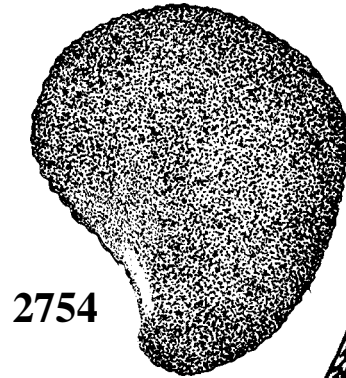
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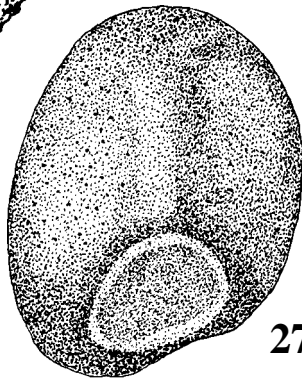
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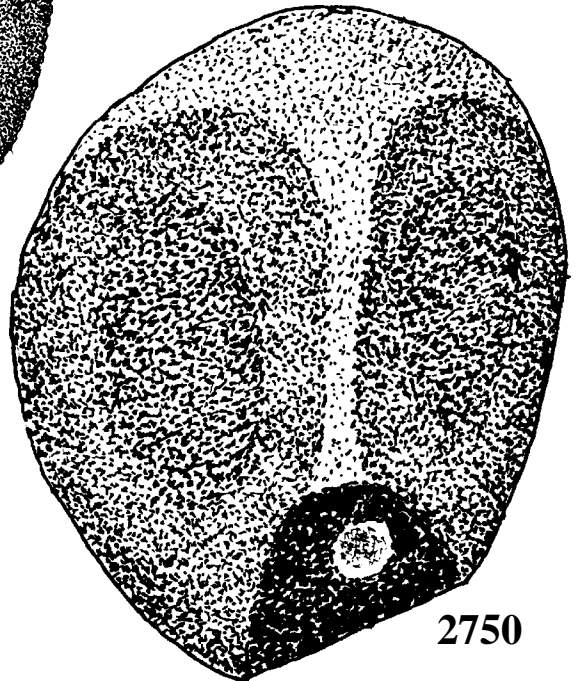
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2754



2753



2750

*gonum*, wet stands; naturalized in the Carpathians. Hu, Mo, Ro, Sk, Uk.

**2756. *Grammica suaveolens*** (Ser.) Desmoul., *Cuscuta suaveolens* Ser. — Annual, stem slender, ramified, 20-50 cm high, orange-red. **Seeds globose or obovoid, one-sided flattish, with large hilum, 1.3-1.9 x 1.1-1.7 mm. Surface fine reticulate-foveate, dull, brown to dark-brown. 2n = 60.** Originally growing in South America; hauling into lucerne and clover fields, rarely on other herbs; naturalized in the Carpathians. Br, Pl, Ro, Sk, Uk.

**2757. *Monogynella lupuliformis*** (Krocker) Hadač et Chrték, *Cuscuta lupuliformis* Krocker — Annual, stems thin, reddish, 50-160 cm long, ramified, dark-red warty. **Seeds obovoid to ellipsoid, lateral compressed, dorsal side convex, ventral concave with distinct hilum, 2.4-3 x 2.3-2.6 mm. Surface reticulate-foveate, dull, glabrous, brown. 2n = 28.** Native to Eurasia, on coastal shrubberies, on *Salix*, *Humulus*, *Urtica*, rarely on *Ulmus*; throughout the Carpathians.

### 131. POLEMONIACEAE

**2758. *Polemonium caeruleum*** L. — Perennial, stems simple, 30-90 cm high, leafy, glabrous below, hirsute and glandular above, angular. **Seeds ellipsoid trigonous, dorsal side convex, ventral with rib and with membranous wings on one or both ends, 2.8-3.2 x 1.2-1.4 mm. Surface scabrous, slight lustrous, dark-purple. 2n = 18.** Native to European mountains, on limestone hills, wet meadows, shady coastal shrubberies; often grown in gardens as an ornamental, often naturalized. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**2759. *Phlox divaricata*** L. — Stems 20-30 cm high, slight procumbent, sparsely branched, flowering stems erect, unflowering creeping. **Seeds obovoid, lateral compressed, dorsal side convex, ventral flat, with a deep longitudinal suture, 2.6-3 x 1.9-2.1 mm. Surface wrinkly and scrobiculate, lustreless, brown to dark-brown.** Native to the USA, in undergrowth of moist woods; cultivated in the Carpathians in gardens as an ornamental.

**2760. *Phlox drummondii*** Hook — Annual, stems 5-40 cm high, hirsute and glandular. **Seeds ellipsoid, dorsal side convex, ventral sides rooflike and flat with a longitudinal furrow, 2.7-3 x 1.7-1.9 mm. Surface wrinkly, humpy, reticulate, dull, brown.**

**2n = 14.** Place of origin North America; often cultivated in gardens and parks as an ornamental. Hu, Mo, Ro, Sk, Uk.

**2761. *Phlox paniculata*** L. — Perennial, stems 20-120 cm high, bare, erect, branched only above. **Seeds obovoid to ellipsoid or spindleform, flattish, dorsal side convex, ventral side with a distinct furrow, apex pointed, 4.1-4.6 x 2.5-2.8 mm. Surface humpy, slight lustrous, reddish- or blackish-brown. 2n = 14.** Place of origin North America; often cultivated in gardens in many cultivars or varieties. Hu, Mo, Ro, Sk, Uk.

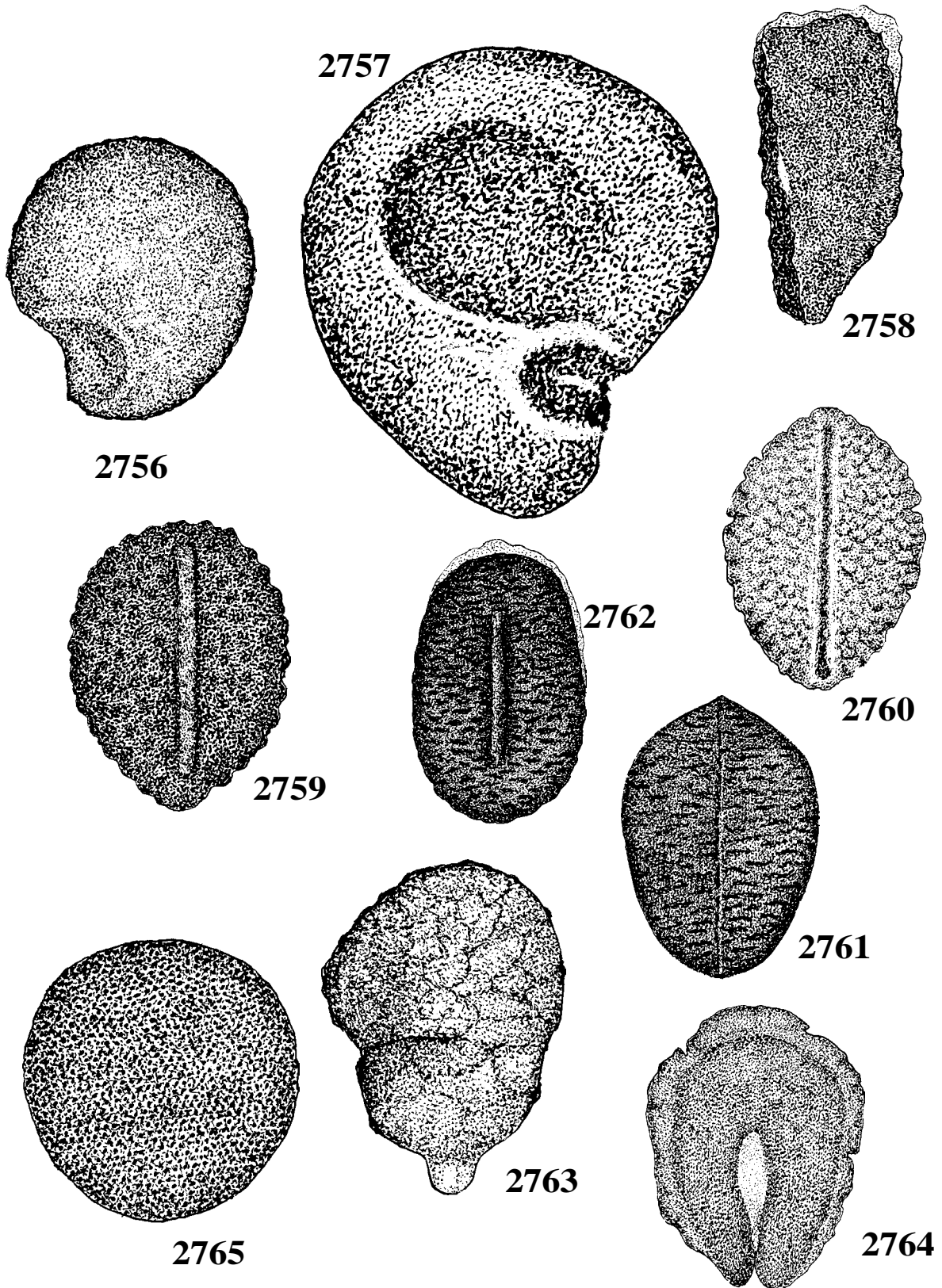
**2762. *Collomia grandiflora*** Dougl. ex Lindl., *Gilia grandiflora* (Dougl.) Aschers. et Graebn. — Annual, stems 10-60 cm high, erect, non-ramified, densely leafy. **Seeds prolonged ellipsoid, slight flattish, dorsal side convex, ventral side with a distinct or an indistinct furrow, apex with a narrow wing, 3-3.4 x 1.6-1.8 mm. Surface wrinkly, dull, glabrous, dark-brown. 2n = 16.** Place of origin North America; as an ornamental summer plant cultivated in gardens. Hu, Pl, Sk.

**2763. *Gilia tricolor*** Benth. — Annual, stems 20-50 cm, glandular-hirsute, erect, simple or branched above. **Seeds very irregular in shape, dorsal and ventral sides are indistinct, 1.5-2 x 0.8-1.3 mm. Surface wrinkly, dull, glabrous, yellowish, to brown. 2n = 18.** Native to North America; in the Carpathians seldom cultivated in gardens as an ornamental summer plant. Sk.

**2764. *Cobaea scandens*** Cav. — Perennial, trailing shrub, 6-8 m high, stems glabrous. **Seeds spherical, horseshoe from ventral side, with a membranous wing around the whole edge, 12-15 x 9-12 mm. Surface fine reticulate-foveate, dull, dark-brown, the wing pale, with a paler spot (hilum) on the ventral side in the lower half of the seed.** Native in Mexico; frequently cultivated as obstacle fences, on balconies, in parks and gardens. Hu, Ro, Sk.

### 132. HYDROPHYLLACEAE

**2765. *Ellisia nyctelea*** L. — Annual, scattered hirsute, stems ascendent, ramified, 20-30 cm high. **Seeds more or less spherical with indistinct dorsal, ventral sides and hilum, 2.5-2.7 x 2.5-2.7 mm. Surface reticulate-foveate, dull, glabrous, black. 2n = 20.** Place of origin North America; cultivated in the Carpathians in gardens as an ornamental.





**2766. *Phacelia tanacetifolia*** Benth. — Annual, stems erect, 20-80 cm high, hirsute, glandular-pubescent, glabrous below, branched above. **Seeds ellipsoid, convex on dorsal side, two ventral sides rooflike and flat or concave with a keel on top, 2.4-3 x 1.2-1.5 mm. Surface dull, glabrous, with transversal, arranged sockets dark-brown. 2n = 22.** Native to North America; often cultivated in gardens and fields as a honey-bearing plant, often naturalized as weed. Hu, Mo, Pl, Ro, Sk, Uk.

**2767. *Nemophilla menziesii*** J. D. Hook. et Arn. — Annual, stems erect, 10-30 cm, diffuse ramified, downy. **Seeds shaped irregular, mostly oval with a wavy edge, 2.4-2.8 x 1.6-2 mm. Surface waved with rounded spots, dull, brown. 2n = 28.** Place of origin North America; cultivated in the Carpathians in gardens as an ornamental and sometimes escaping.

**2768. *Argusia sibirica*** (L.) Dandy, *Tournefortia sibirica* L., *Messersmidia sibirica* L. — Perennial, stems 15-40 cm high, erect, simple or branched. **Seeds ellipsoid to depressed spherical, dorsal side convex, on ventral side obovoid hilum, beak straight, horizontal, 2.1-2.5 x 2.5-3 mm. Surface wrinkly, ruminate, dull, light-brown, hilum dark-brown with a pale narrow wing. 2n = 26.** Native to Eurasia, on sandy saline sea and lake margins. Mo, Ro, Uk.

### 133. HELIOTROPIACEAE

**2769. *Heliotropium europaeum*** L., *H. stevenianum* Andr. ex Besser — Annual, stems 10-40 cm high, erect or ascending, usually branched, appressed- to erecto-patent-pubescent. **Seeds teeth or pear shaped, not hairy, 1.9-2.2 x 1.3-1.5 mm. Surface glabrous or pubescent, usually rugose, dull, green (young seeds) to greyish-brown or black (pre-mature). 2n = 32.** Native to Eurasia, on fields, vineyards, sandy fallows. Hu, Mo, Ro, Sk, Uk.

**2770. *Heliotropium peruvianum*** L., *H. odoratum* Moench — Semishrub, stems ramified, twigs shortly pubescent, aromatic, with blue or violet flowers. **Seeds ovoid or globose, with large conical stigmata, 2.2-2.6 x 1.8-2.2 mm. Surface rugose, dull, dark-brown.** Native to Peru, Ecuador, rarely cultivated in gardens and parks in the Carpathians, aromatic flowers are used in perfumery. Hu, Mo, Ro, Sk, Uk.

### 134. BORAGINACEAE

**2771. *Eritrichium nanum*** (All.) Schrad., *Myosotis nana* All. — Perennial, a plant creating green pillows,

5-10 cm high, flowers on short feet blue. **Nutlets ovoid, dorsal side convex, larger part of the surface dense covered with prickles, narrower bottom part smooth, ventral side flat, from the sides bridged with side excrescences, 4.3-4.8 x 3-3.3 mm. Surface greyish or greyish-brown, ventral side dark-brown.** Native to the East Carpathians, in rock splits of the high mountain zone. Ro, Uk.

**2772. *Buglossoides arvensis*** (L.) Johnst., *Lithospermum arvense* L. — Annual, stems 5-50 cm high, bristly hispidulous, shortly ramified above. **Nutlets ovoid, reminding bishop mitre, on ventral side with distinct keel, hilum oval or rhomboidal, 2.7-3.3 x 1.7-2 mm. Surface rough, dull, verrucose, pale to grey-brown. 2n = 28.** Native to Eurasia, fields, fallows, ruins, stony slopes, vineyards, from lowlands to uplands; in the all Carpathian territories.

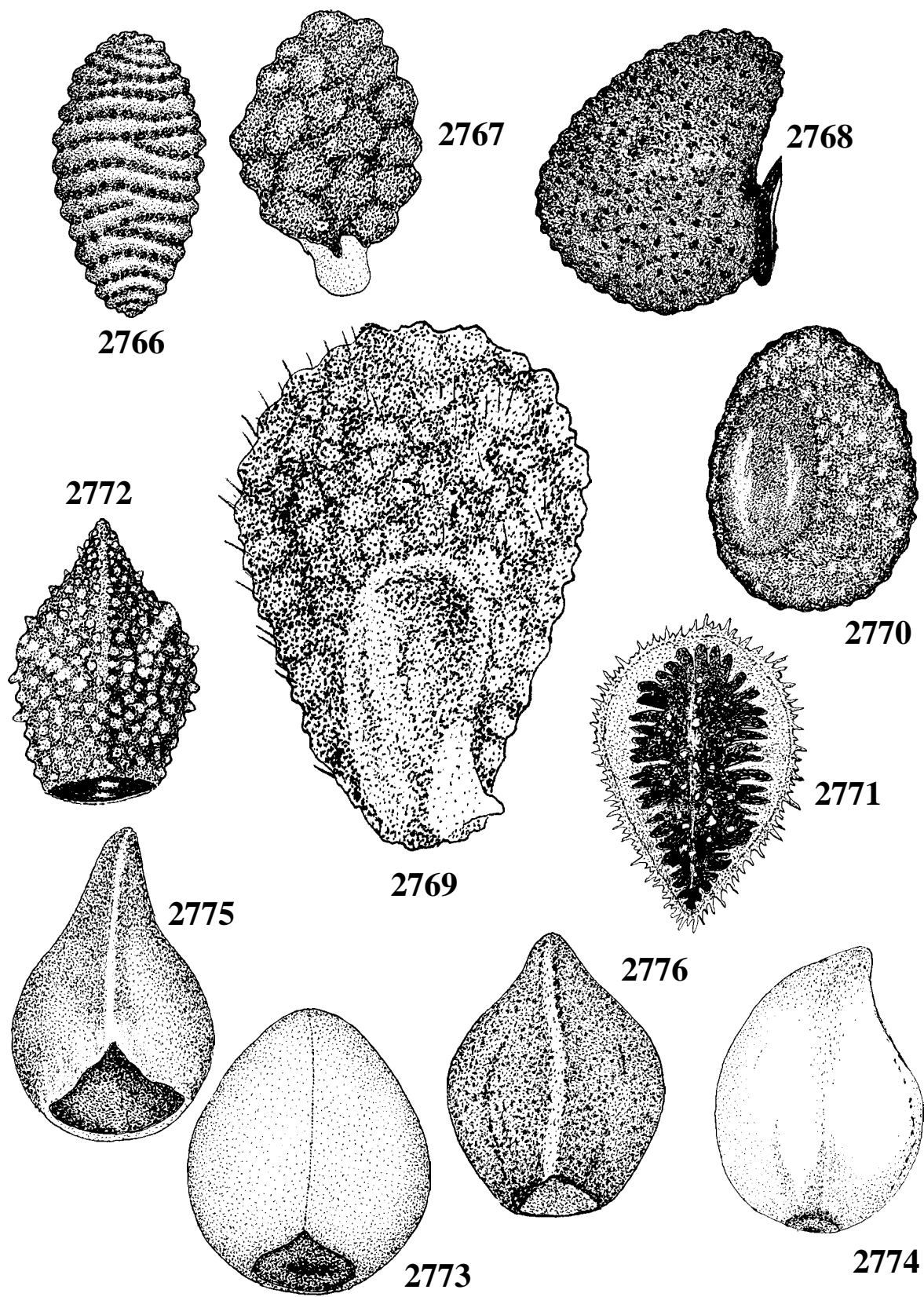
**2773. *Buglossoides purpureocaerulea*** (L.) Johnst., *Lithospermum purpureocaeruleum* L. — Perennial, flowering stems 20-60 cm high, erect, unramified, hirsute. **Nutlets ovoid, globose, dorsal side convex, ventral side obtuse keeled, 3.5-4.2 x 2.9-3.3 mm. Surface smooth, shining, whitish to pale-brown. 2n = 16.** Native to southern and central Europe, light forests, clearings, shrubberies, dryer humous stands; throughout the Carpathians.

**2774. *Lithospermum officinale*** L. — Perennial, stems erect, strong, distinctly ramified above, pubescent, stems 20-100 cm high. **Nutlets ovoid with blunt keel in the ventral side, 3-3.6 x 2.2-2.8 mm. Surface smooth, glabrous, glossy, white. 2n = 28.** Native to Eurasia, on sunny, shrubby slopes, light woods, lowland wet forests, coastal scrubs, on wet and drying out grounds; in the whole Carpathian region.

**2775. *Moltkia petraea*** (Tratt.) Griseb., *Echium petraeum* Tratt., *Lithospermum petraeum* DC. — Small shrub, ramified from base, stems rigid, erect, 20-40 cm high, setaceous. **Nutlets ovoid to trigonous, beak straight or slight lateral curved, base with large triangular hilum, 2.4-3 x 1.5-1.8 mm. Surface smooth, glabrous, lustrous, grey.** Native to southern Europe, stony slopes, rock crevices. Ro.

**2776. *Onosma arenarium*** Waldst. et Kit., *O. echinoides* L. var. *arenarium* (Waldst. et Kit.) DC. — Biennial to perennial, stems erect, 20-70 cm high, much ramified, with basal rosette of leaves. **Nutlets ovoid, dorsal side convex, ventral with keel, hilum trigonous, 2.7-3.2 x 1.8-2.1 mm. Surface**





shining, smooth, glabrous, greyish-brown, with dark-brown spots.  $2n = 20$ . Native to Europe, sandbanks, basic or neutral, drying-up stands. Hu, Ro, Sk, Uk.

**2777. *Onosma echioides* L., *O. jávorkae* Simonk.** — Perennial,  $\pm$  caespitose with several erect flowering stems, 10-30 cm high, simple or with few branches, puberulent. **Nutlets ovoid with strong narrowed apex, dorsal side convex, ventral side rooflike, with distinct keel and flat or slight concave area, 2.5-3 x 2-2.2 mm. Surface smooth, shining, greyish, scarce spotted.  $2n = 14$ .** Native to central part of the southern Europe, dubious in the Carpathians.

**2778. *Onosma heterophylla* Griseb., *O. paradoxa* Janka** — Perennial, caespitose or with long branched stock, with several flowering stems, 15-40 cm high. **Nutlets subovoid, dorsal side convex, ventral rooflike with ridge, apex strong narrowed, base with large subtrigonal hilum, 2.5-3 x 1.9-2.1 mm. Surface smooth, lustrous to glossy, greyish-brown, spotted.** Native to the Balkan Peninsula. Ro.

**2779. *Onosma pseudoarenarium* Schur** — Annual, without basal leaf-rossette, stems erect, 20-60 cm high, with 1 to 2 short twigs on the upper half. **Nutlets subovoid, dorsal side convex, two ventral sides rooflike,  $\pm$  flat, with longitudinal rib in the middle, apex narrowed, bottom truncate, 3.1-3.4 x 2.1-2.3 mm. Surface smooth, glossy, pale-greyish, with dark-brown spots.  $2n = 26$ .** Native to south-central Europe, steppe slopes, stony and sandy soils. Ro, Sk.

**2780. *Onosma rigidum* Ledeb., *O. pallida* Boiss.** — Semishrub with many slender stems, 20-30 cm high, bristly hirsute, simple. **Nutlets ovoid with lateral compressed beak, hilum trigonal, 3.6-4 x 2.3-3 mm. Surface smooth, glossy, glabrous, greyish with brown spots.** Native to eastern Europe; calcareous stony slopes. Ro, Uk.

**2781. *Onosma tauricum* Pall., *O. angustifolia* Schur** — Perennial, 2-3 stems erect or ascendent, unramified or only in the below part, 20-40 cm high. **Nutlets ovoid to trigonal or bipyramidal, dorsal side convex, two ventral sides rooflike, flat, keel indistinct, hilum trigonal, 3-3.4 x 2.1-2.4 mm. Surface smooth, glossy, glabrous, greyish with brown spots.  $2n = 14$ .** Native to Europe and Asia Minor, limestone screes, rocky and sandy slopes, steppes. Mo, Ro, Uk.

**2782. *Onosma tornensis* Jáv., *O. stellulata* Hazslinszky non Waldst. et Kit.** — Perennial, stems erect or ascendent, 15-30 cm high, simple stellate-setose. **Nutlets ovoidal, remind bishop mitre, keel on ventral side, 2.4-2.8 x 1.8-2 mm. Surface smooth, glabrous, glossy, greyish with brown spots.  $2n = 14$ .** Endemic to Slovakia, sunny karst steppes. Hu, Sk.

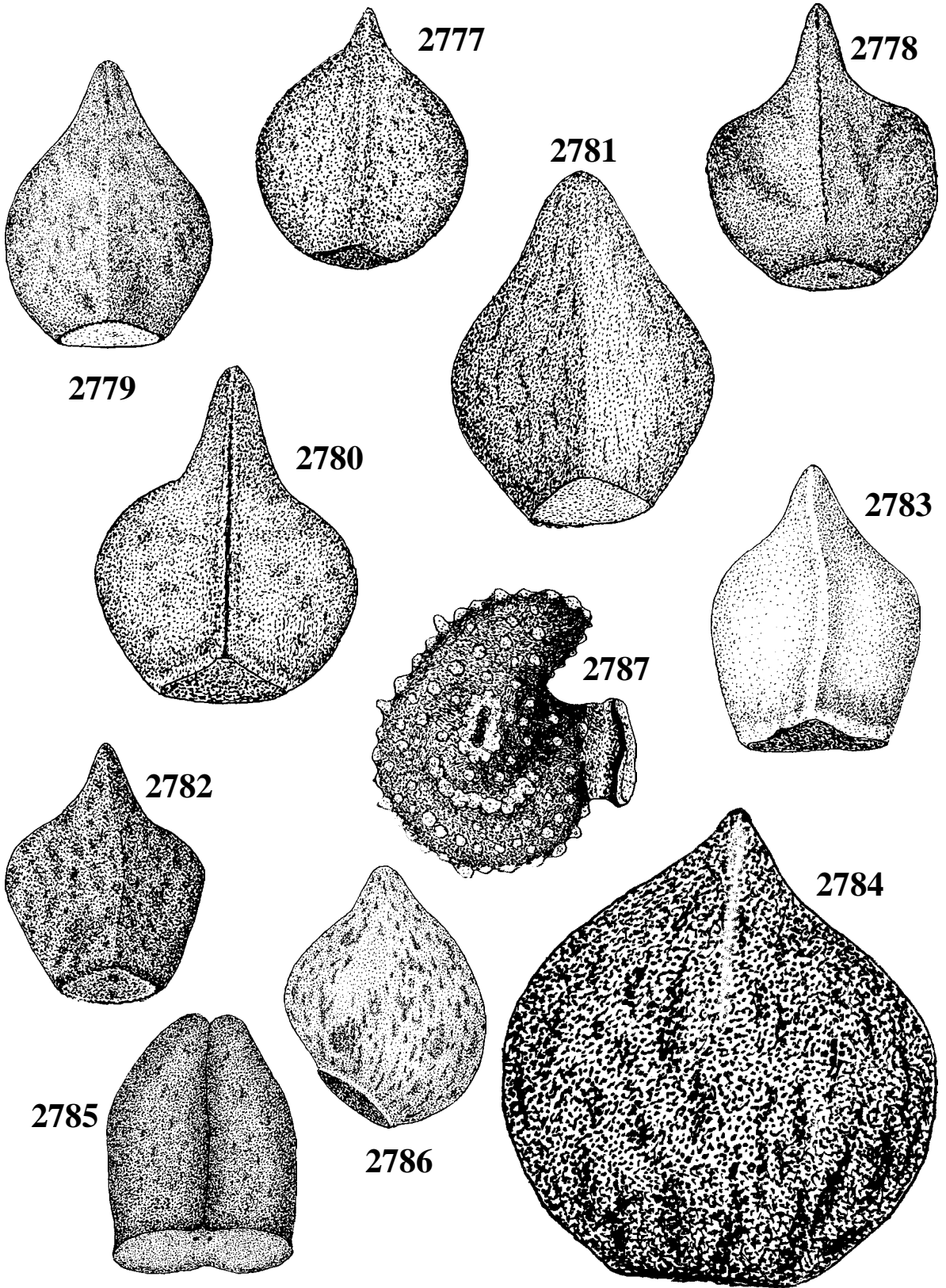
**2783. *Onosma visianii* Clementi, *O. setosum* Borbás non Ledeb., *O. echioides* Jacq. non L.** — Biennial, stems erect, 20-50 cm high, much prostrate ramified, bristly hirsute. **Nutlets ovoid, dorsal side convex, ventral keeled, base trigonal, blackish, 4.2-5 x 3-3.5 mm. Surface minute tuberculate, lustrous, whitish-grey or -brown.  $2n = 18$ .** Native to Europe, stony and karst steppes, calcareous soils. Hu, Ro, Sk, Uk.

**2784. *Cerinthe glabra* L., *C. alpina* Kit.** — Perennial, stems 20-50 cm high, erect or ascendent, glabrous. **Nutlets ovoid-globose, shortly beaked, keeled ventrally and dorsally in the upper half, base flat, 3.4-4 x 2.7-3.2 mm. Surface smooth, dark-brown with black spots, slight lustrous.  $2n = 18$ .** Native to central and southern Europe, usually damp or shady places, roadsides, rock hedges, limestone slopes. Pl, Ro, Sk.

**2785. *Cerinthe major* L.** — Annual, stems 20-60 cm high, erect. **Nutlets ovoid, apex with short beak, dorsal side convex, ventral slight concave, 4.2-5.6 x 3.3-3.7 mm. Surface smooth dull or faint lustrous, greyish-brown with blackish spots.  $2n = 16, 18$ .** Native to the Mediterranean, roadsides, damp waste places and meadows, cultivated fields; sometimes planted as an ornamental in gardens. Sk.

**2786. *Cerinthe minor* L., *C. acuta* Moench** — Annual, biennial or perennial, stems 15-60 cm high. **Nutlets broad ovoid, with a rib on ventral side, apex with short beak, hilum  $\pm$  rounded, 2.7-3.5 x 2.2-2.6 mm. Surface smooth, lustrous, glabrous, greyish-brown with blackish spots.  $2n = 24, 36$ .** Native to Eurasia, fields and gardens, vineyards, roadsides, scrubs, stony places, forest steppes; in the all Carpathian territories.

**2787. *Alkanna tinctoria* (L.) Tausch, *Lithospermum tinctorium* L.** — Perennial, turfed, bristly hirsute, stems procumbent or ascendent, unramified. **Nutlets subreniform to oblique ovoid,  $\pm$  stipitate, beak straight and horizontal or curved and moderate or strong deflexed, 1.8-2.3 x 1.9-2.3 mm. Surface texture various tuberculate, scrobiculate or retic-**



ulate, often in combination, rare smooth, greyish.  $2n = 30$ . Native to Eurasia, sandbanks and dry, warmer sandy places. Hu, Ro, Sk, Uk.

**2788. *Mertensia primuloides*** Clarke, *Pulmonaria primuloides* — Perennial, stems 10-15 cm, leaves ovoidal, whole margined, much hairy, stems scarcely leafed; flowers small, glossy dark-blue. **Nutlets obovoid, dorsal side convex, bottom of the ventral side triangular, flat, 3.9-4.3 x 2.6-2.9 mm. Surface aculeate, dull, greyish pale-brown.** Native to the Himalayas; in the Carpathians rarely cultivated as an ornamental in gardens.

**2789. *Echium italicum*** L., *E. altissimum* Jacq. — Biennial, stems erect, 50-100 cm high, usually with a single or a dominant flowering stem. **Nutlets ovoid-trigonal with keel on ventral and dorsal side in the upper half, beak erect, hilum flat, 3.2-3.8 x 2.3-2.5 mm. Surface rugose-tuberculate and reticulate, dull, greyish, hilum greenish.  $2n = 16, 32$ .** Native to Eurasia, grassy slopes, boundaries, pastures, fields, disturbed grounds. Hu, Mo, Ro, Sk.

**2790. *Echium plantagineum*** L., *E. lycopsis* L. p. p. — Annual to biennial, stems 20-80 cm high, erect, softly hairy, with one or many flowering stems. **Nutlets ovoid-pyramidal, with prominent ventral and in the upper half dorsal keel, short erect beaked, 2.6-3 x 2.1-2.3 mm. Surface tuberculate and faint striate, dull, grey.  $2n = 16$ .** Native to southwestern Europe, roadsides, fields and sandy areas near seas, recently hauling into central and eastern Europe.

**2791. *Echium russicum*** J. F. Gmel., *E. rubrum* Jacq. non Forsk., *E. maculatum* L. — Biennial, stems erect, hispid, 25-50 cm high, with one or several flowering stems. **Nutlets trigonous, base flat, dorsal side convex with keel in the upper half, ventral side with longitudinal keel, marginate, beak lateral compressed, 2-2.5 x 1.6-1.8 mm. Surface fine tuberculate, dull, blackish-brown.  $2n = 12, 24$ .** Native to central and southeastern Europe, meadows and uncultivated slopes, scrubs, sunny and forest-steppes. Hu, Mo, Pl, Ro, Sk.

**2792. *Echium vulgare*** L., *E. pannonicum* Wierzb., *E. violaceum* auct non L. — Biennial or perennial, stems 20-100 cm high, erect, stout, unramified or only below, pubescent. **Nutlets trigonous, keel on ventral side and in upper half of dorsal side, beak lateral flattish, 2.4-2.8 x 1.5-1.8 mm. Surface humpy rough, dull, greyish-brown.  $2n = 16, 32$ .**

Native to Eurasia, weedy places, roadsides verges, embankments, barren lands, scrubs, rocky stands; throughout the Carpathians.

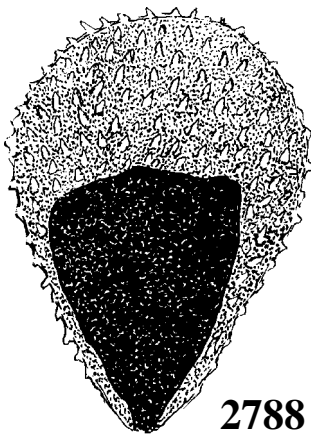
**2793. *Pulmonaria angustifolia*** (L.), *P. azurea* Bess. — Perennial, stems erect, branched above, 10-30 cm high. **Nutlets ovoid, narrow hem around, base with smooth collar-like ring and footlet, 3.8-4.2 x 2.6-2.8 mm. Surface fine reticulate-foveate, or glabrous, glossy, black.  $2n = 14$ .** Native to Europe, light deciduous forests and shrubberies, stony, sandy, calcifugous grounds; throughout the Carpathians.

**2794. *Pulmonaria filarszkyana*** Jáv., *P. rubra* var. *dacica* Simonk. — Perennial, in habitus very similar to *P. rubra*. **Nutlets ovoid, apex narrowed, with narrow hem, base with smooth collar-like ring and footlet, 3.5-4 x 2.8-3.2 mm. Surface smooth, glossy, glabrous, blackish-brown.** Native to the eastern Carpathians, dark spruce and juniper-three forests. Pl, Ro, Uk.

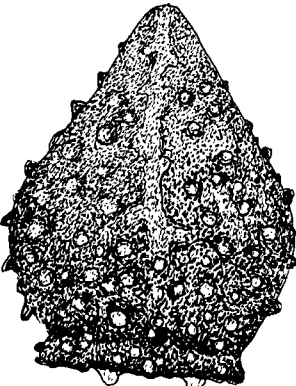
**2795. *Pulmonaria mollis*** Wulf. ex Hornem., *P. montana* Lej. subsp. *mollis* (Wulf.) Gams., *P. mollissima* A. Kerner — Perennial, stems ascending up to erect, 20-40 cm high. **Nutlets ovoid, apex with narrow hem, base with smooth collar-like basal ring and footlet, 4.2-4.6 x 2.9-3.2 mm. Surface smooth, glossy, glabrous, blackish-brown.  $2n = 18$ .** Native to Europe, light humous deciduous forests, meadows slopes, stony shady places, clearings, steppes in montane and subalpine zones. Pl, Ro, Sk, Uk.

**2796. *Pulmonaria murinii*** Májovský, *P. mollissima* auct. non Kerner — Very similar to *P. mollis*, different in the leaf shape. **Nutlets ovoid, with narrower apex, narrowly hemmed, base with basal ring and footed, 3.8-4.2 x 2.6-2.9 mm. Surface smooth, glossy, glabrous, dark-brown.  $2n = 14$ .** Endemic to the Slovak Carpathians, scattered in mountains. Hu, Sk.

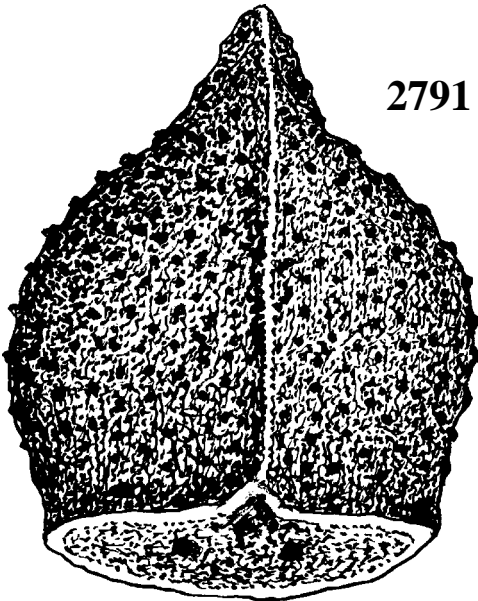
**2797. *Pulmonaria obscura*** Dumort., *P. officinalis* L. subsp. *obscura* (Dumort.) Murb. — Perennial, stems ascendent to erect, 10-30 cm high. **Nutlets ovoid, apex acuminate, base with collar-like basal ring and footed, 3.8-4.2 x 2.8-3 mm. Surface smooth, glossy, glabrous, blackish-brown.  $2n = 14$ .** Native to Eurasia, light and humous deep loamy-sand grounds; in all Carpathian territories.



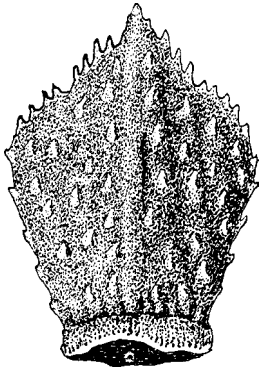
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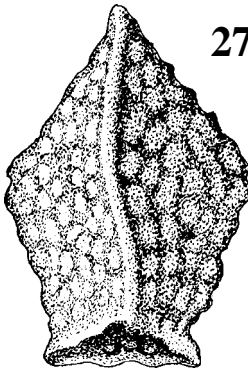
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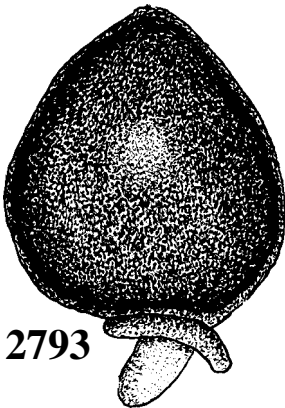
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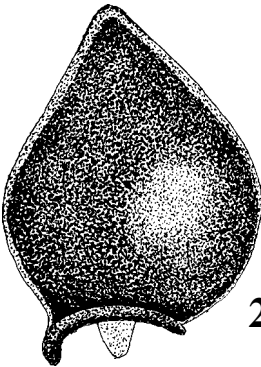
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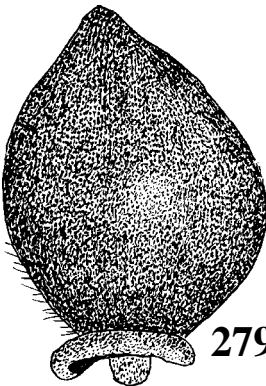
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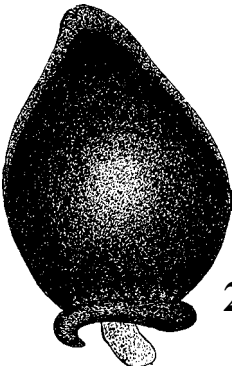
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**2798. *Pulmonaria officinalis*** L. — Perennial, very similar to *P. obscura*. **Nutlets broad ovoid, short acuminate, with two acute keels (dorsal and ventral) around the seed, base with collar-like basal ring and footed, 3.6-4 x 2.5-3 mm. Surface smooth, glossy, glabrous, collar ring smooth, blackish-brown.  $2n = 16$ .** Native to Europe, deciduous (oak and beech) forests, shrubberies, from lowland up to the upland zone. Hu, Mo, Pl, Ro, Sk, Uk.

**2799. *Pulmonaria rubra*** Schott, *P. transsylvanica* Schur — Perennial, stems glandular above. **Nutlets ovoid, with narrowed apex, base with basal ring and footed, 4-4.5 x 3-3.5 mm. Surface with indistinct keel, lustrous, smooth, glabrous, blackish-brown.  $2n = 14$ .** Endemic to the eastern Carpathian and the Balkan mountains, mostly deciduous mountain forests. Hu, Pl, Ro, Uk.

**2800. *Nonea lutea*** (Desr.) DC., *Lycopsis lutea* Desr. — Annual, bristly hirsute, glandular pubescent, stems erect or ascendent, ramified. **Nutlets oblong-ellipsoid, collar-like basal ring smooth, 3.4-3.9 x 1.9-2.2 mm. Surface smooth, rugose, weak ribbed, greyish-brown, yellowish footed at base.  $2n = 14$ .** Native to southeastern Europe, stony slopes, steppes, semisteppes and oak forests; occasionally hauling into central and southern Europe and naturalized there. Hu, Ro, Sk, Uk.

**2801. *Nonea pulla*** (L.) DC., *Lycopsis pulla* L. — Perennial (annual), shortly and densely grey setose and  $\pm$  glandular-pubescent, stems 25-50 cm high, erect, usually branched above. **Nutlets slanting ovoid-globose, with narrow winged hem on tip and collar-like basal ring on base, 3.5-4 x 2.5-3 mm. Surface dull, with ascendent venation, collar ring ribbed, brown.  $2n = 14, 28$ .** Native to Eurasia, dry meadows and pastures, boundaries, sunny grassy slopes; throughout the Carpathians.

**2802. *Nonea rosea*** (M. Bieb.) Link — Annual, bristly-hirsute, glandular, stem simple, ascending or procumbent at the base, 10-20 cm high, basal leaves oblong-cordate. **Nutlets ovoid-ellipsoid, with a collar-like basal ring, footed in hilum, 3.5-4 x 2.3-2.6 mm. Surface waved, ribbed, dull, greyish or greyish-brown.  $2n = 16$ .** Native to the Caucasus; rarely hauling into the Carpathians.

**2803. *Symphytum angustifolium*** A. Kern, *S. tuberosum* subsp. *nodosum* (Schur) Soó p. p. —

Perennial, stems slender, ramified in the upper half. **Nutlets globose, with narrow hem on dorsal and ventral sides, basal hilum ring smooth with some teeth and footed, 4-4.5 x 2.4-2.6 mm. Surface waved, lustrous, glabrous, brown or black.  $2n = 32$ .** Native to central and southeastern Europe, wet meadows and flood-plains, humous, deciduous forests, in warmer areas. Ro, Sk.

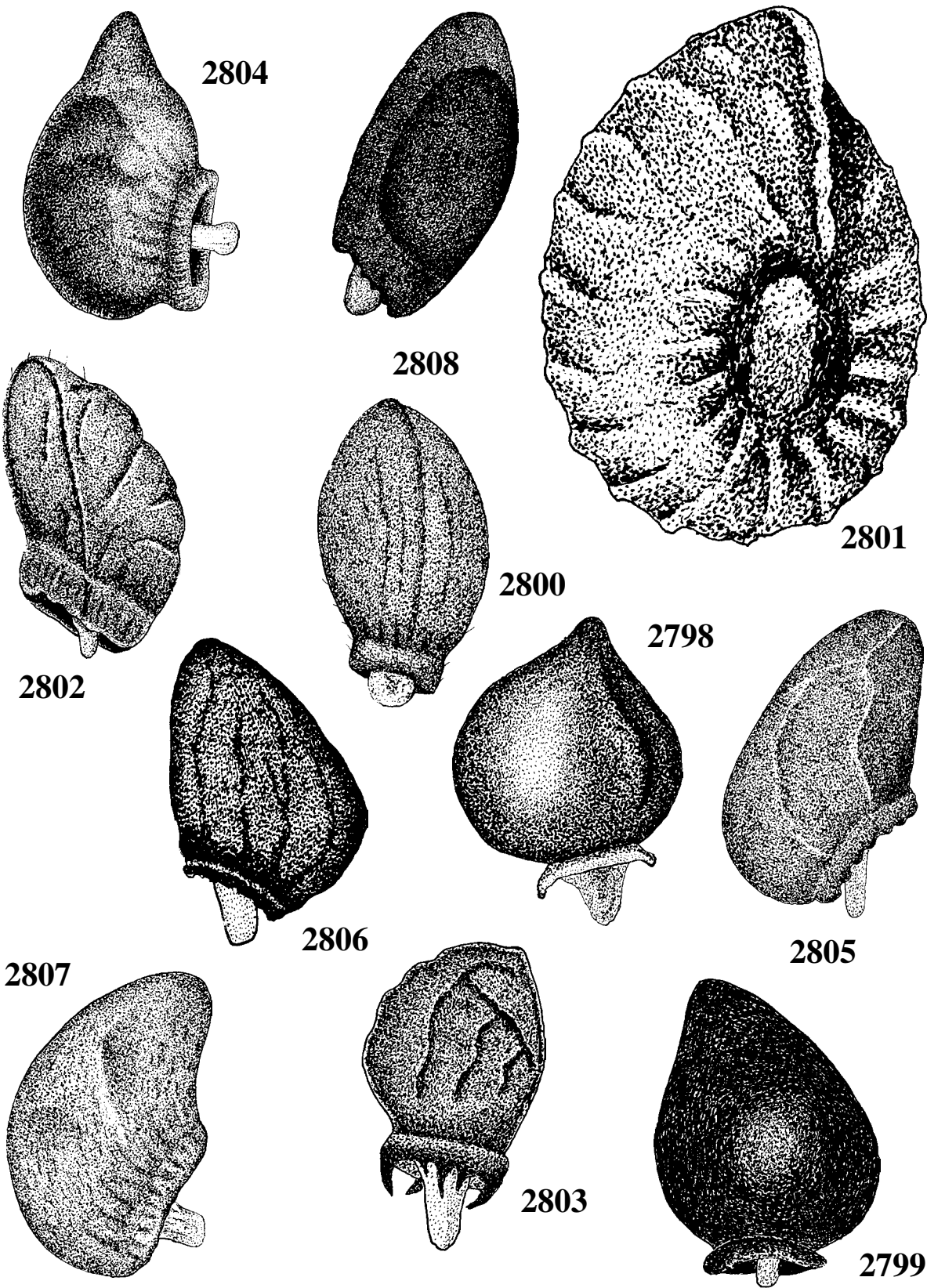
**2804. *Symphytum asperum*** Lepech., *S. asperrimum* Donn — Perennial, stems 80-150 cm high, erect, ramified, dispersed bristly hirsute. **Nutlets ovoid-trigonal, with some ribs, apex mostly shifted on side, basal ring mostly smooth, hilum footed, 4.2-5.2 x 2.5-3 mm. Surface waved, lustrous, glabrous, brown, blackish-brown.  $2n = 32$ .** Originally growing in the Caucasus and Asia Minor; formerly cultivated as the forage crop, naturalized today. Hu, Uk.

**2805. *Symphytum bohemicum*** F. W. Schmidt, *S. officinale* L. subsp. *bohemicum* (F. W. Schmidt) Čelak. — Perennial, stems softly and fine hirsute above, 30-80 cm high. **Nutlets ovoid, apex rounded or apiculate, basal ring smooth, hilum footed, 4.3-4.7 x 2.5-2.8 mm. Surface waved, glossy, glabrous, dark- or blackish-brown.  $2n = 24$ .** Native to Eurasia, boggy valley meadows, wet lowland forests of the foothills. Cz, Ro, Sk, Uk.

**2806. *Symphytum cordatum*** Waldst. et Kit. ex Willd. — Perennial, stems erect, 15-50 cm high, angular, softly hirsute. **Nutlets ovoid, ribbed, basal ring smooth, dentate hilum footed, 3.3-4 x 2.4-3 mm. Surface waved, lustrous, glabrous, black.  $2n = 120$ .** Native to the eastern Carpathians, shady wet woodlands, humous, basic to neutral grounds. Pl, Ro, Sk, Uk.

**2807. *Symphytum officinale*** L. — Perennial, bristly hirsute, stems stout, erect, 30-100 cm high, vertical branched, ramified. **Nutlets oblique ovoid, convex on dorsal side, rooflike constricted on ventral side, basal ring wrinkly, hilum dentate, whitish footed. Surface indistinct rugose, glossy, glabrous, dark-brown to black.  $2n = 26, 48$ .** Native to Eurasia, wet meadows, coastal plains, boundaries, wet lowland forests, fields; throughout the Carpathians.

**2808. *Symphytum orientale*** L. — Perennial, stems erect, angular, ramified, shaggy, height of up to 70 cm or more, much branched. **Nutlets prolonged ovoid, with lateral and apex hem, basal ring**



slight distinct, hilum footed, 4.4-5 x 2.3-2.7 mm. Surface ribbed, waved, glossy glabrous, dark-brown. Native to eastern Europe, damp places in deciduous forests. Uk.

**2809. *Symphytum tauricum*** Willd. — Perennial, stock fusiform, stems 20-60 cm high, rather stout, much branched, densely hairy. **Nutlets prolonged ovoid, basal ring smooth, hilum long footed, 2.8-3.2 x 1.3-1.5 mm. Surface longitudinal ribbed, waved, lustrous, pale or dark-brown.** Native to southeastern Europe, woods. Mo, Ro, Uk.

**2810. *Symphytum tuberosum*** L. — Perennial, stems and leaves shortly hirsute, stems erect, simple or little ramified, densely hairy, 20-60 cm high. **Nutlets spherical-ovoid, basal ring smooth, hilum long footed, 3-3.6 x 2.4-2.8 mm. Surface longitudinal ribbed, waved, slight lustrous, black. 2n = 96.** Native to central and southern Europe, deciduous woods and other damp and shady places; throughout the Carpathians.

**2811. *Symphytum x uplandicum*** Nyman (*S. asperum* x *officinale*) — Stems up to 2 m high. **Nutlets ovoid, basal ring smooth, hilum footed, 4.7-5.3 x 2.8-3.2 mm. Surface indistinct ribbed, waved, slight lustrous, glabrous, black. 2n = 40.** Settled hybrid, previously cultivated on fields as a fodder plant, uniquely naturalized, mostly in mountain zone.

**2812. *Brunnera macrophylla*** (Adam) Johnst., *Myosotis macrophylla* Adam — Perennial, stems erect, bristly hairy and pubescent, 20-50 cm high, simple. **Nutlets oblong-ovoid, slight asymmetrical, collar-like basal ring, basal hilum footed, 3-3.8 x 2.2-2.8 mm. Surface longitudinal weak ribbed, rugose and tuberculate, dull, collar ring ribbed, dark-brown. 2n = 12.** Originally growing in the Caucasus; in the Carpathians rarely cultivated in gardens and locally naturalized. Sk.

**2813. *Anchusa azurea*** Mill., *A. italica* Retz. — Perennial or biennial, stems erect, up to 150 cm high, much ramified, rarely simple, hispid with dense tubercle-based hairs. **Nutlets trigonous, dorsal side convex, ventral flattish, basal ring grooved, hilum footed, 7-9.5 x 3.5-4.5 mm. Surface ribbed and tuberculate, dull, brown. 2n = 32.** Native to the Mediterranean; hauling into disturbed grounds, sandy and loamy fallows and ways. Hu, Mo, Ro, Sk, Uk.

**2814. *Anchusa barrelieri*** (All.) Vitm., *Buglossum barrelieri* All. — Perennial, turfed with stiff hairs, stems erect, 50-80 cm high. **Nutlets oblique ovoid, erect or slight tended, basal hilum ring large, grooved, 2.3-2.7 x 3.5-4 mm. Surface ribbed, fine tuberculate, dull, dark-brown. 2n = 16, 18.** Native to Eurasia, sunny, grassy and shrubby slopes, sandbanks. Hu, Mo, Pl, Ro, Sk, Uk.

**2815. *Anchusa gmelinii*** Ldb., *A. angustifolia* Bess. — Perennial, rarely biennial, stems erect, 50-80 cm high, simple or ramified, glabrescent. **Nutlets oblique ovoid or subreniform, apex narrowed, basal hilum ring large, grooved, 2.3-2.7 x 3.5-4 mm. Surface ribbed, fine tuberculate, dull, greyish-brown.** Native to eastern Europe, river and maritime sands, steppes. Mo, Ro, Uk.

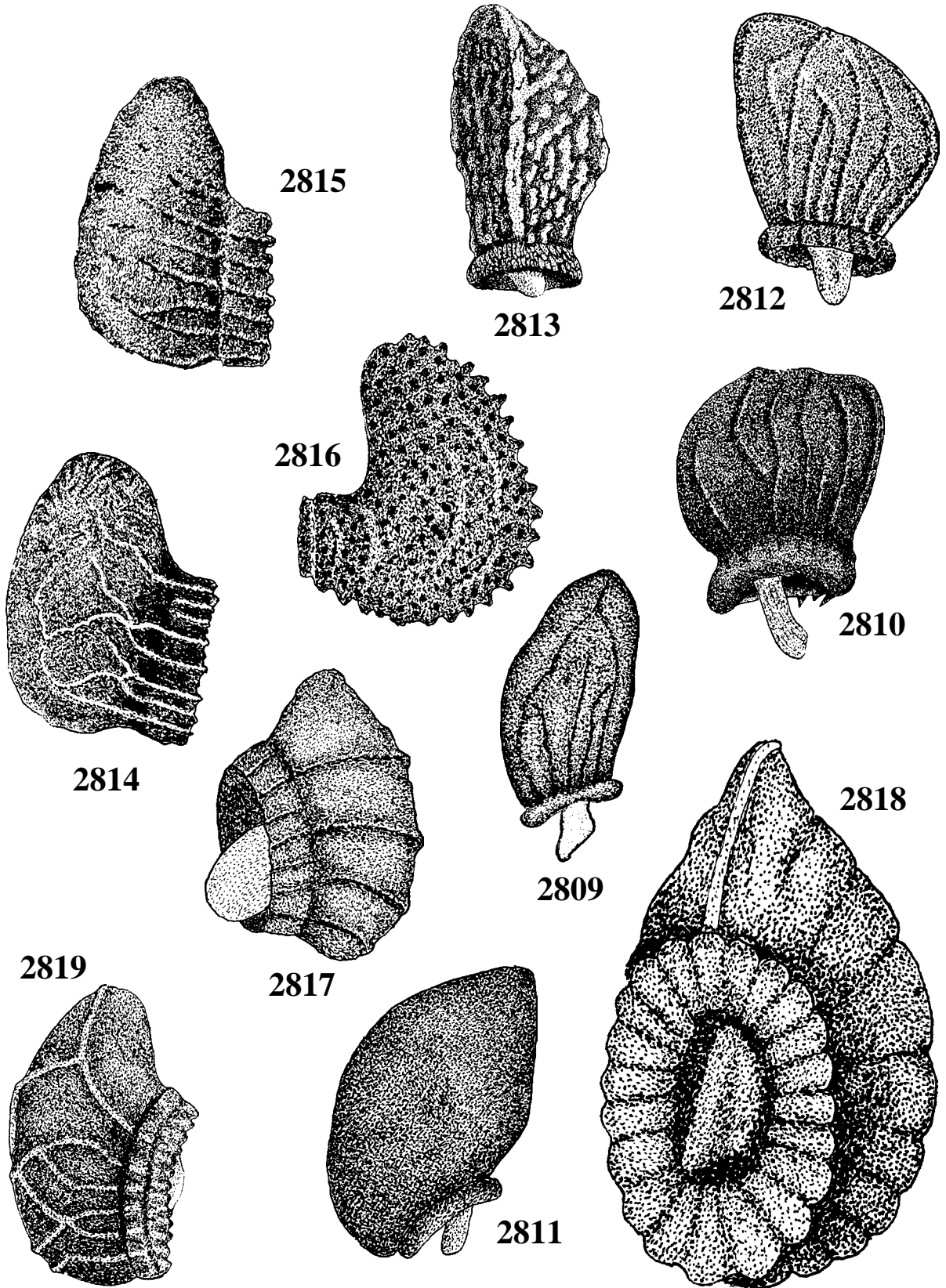
**2816. *Anchusa leptophylla*** Roem. et Schult. — Perennial, stems simple or strong ramified, tomentose. **Nutlets oblique ovoid, tended, 1.9-2.5 x 2.2-2.8 mm. Surface distinct tuberculate, dull, dark-brown.** Native to southeastern Europe, steppes and stony slopes, roadsides. Ro, Sk, Uk.

**2817. *Anchusa ochroleuca*** Bieb., *A. pseudochoroleuca* Schost. — Perennial, rare biennial, densely softly hirsute with scattered stiff hairs, stems 20-70 cm high. **Nutlets oblique ovoid, apex narrowed, base whitish footed, hilum ring large, 2.1-2.3 x 2.8-3.2 mm. Surface tuberculate, ribbed, dull, dark-brown. 2n = 24.** Native to southeastern Europe; hauling into central Europe on sandy grounds. Hu, Ro, Uk.

**2818. *Anchusa officinalis*** L. — Perennial (biennial), hispidulous hirsute, stem erect, 20-80 cm high. **Nutlets oblique aslant ovate, lateral slight flattish, apex slight tended, basal hilum ring wrinkly, 2.2-2.6 x 3.8-4.2 mm. Surface ribbed, verrucose, dull, dark-brown. 2n = 16.** Native to the Mediterranean region, sunny pastures, stony and shrubby slopes, boundaries, disturbed grounds; throughout the Carpathians.

**2819. *Anchusa procera*** Bess. ex Link — Perennial, having one or more stems, erect up to 150 cm, simple or ramified at base, glabrescent. **Nutlets ovoid, apex narrowed, with large basal hilum ring, 2.2-2.6 x 3.5-4.1 mm. Surface with some ribs waved, dull, brown to dark-brown. 2n = 16.** Native to southern Europe, steppes, steppe slopes, sandy and weedy places. Mo, Pl, Ro, Uk.





**2820. *Lycopsis arvensis* L., *Anchusa arvensis* (L.) M. Bieb.** — Annual to biennial, bristly hirsute, with tubercle-based hairs, stems ascending, 10-60 cm, simple or ramified. **Nutlets irregular ovoid with prolonged tip, basal hilum large with grooved ring, 3.2-3.8 x 1.9-2.3 mm. Surface dull, ribbed, dense tuberculate, greyish-brown to grey. 2n = 48.** Native to southeastern Europe, fields, fallows, disturbed grounds, sandbanks, from lowlands to uplands; in all Carpathian regions.

**2821. *Lycopsis orientalis* L., *Anchusa orientalis* Rchb. fil.** — Annual, plant similar to *L. arvensis*, hairs shorter but thicker, stems more ramified. **Nutlets oblique ovoid with prolonged tip, basal hilum large with slight grooved ring, 2.8-3.2 x 2-2.3 mm. Surface dense tuberculate, dull, ribbed, pale-brown.** Native to southeastern Europe and Asia; fields, vineyards, roadsides, orchards, waste places. Hu, Mo, Pl, Ro, Uk.

**2822. *Borago officinalis* L.** — Annual, stems erect, 20-70 cm high, rough, ramified, scarcely hairy, hairs of warts setose. **Nutlets oblong-ovoid, thicken at the base, collar-like, hilum footed, 4.5-5.5 x 2.5-3.5 mm. Surface waved, longitudinal ribbed, dull, blackish-brown. 2n = 16.** Native to southern Europe, dry, often waste places, widely cultivated for ornament in warmer areas and naturalized. Hu, Mo, Pl, Ro, Sk, Uk.

**2823. *Asperugo procumbens* L.** — Annual, scarcely hairy, stems procumbent or trailing, ramified, 20-70 cm high. **Nutlets obovate to oval, lateral compressed, apex broad oval, edge narrowly hemmed, base narrowed, hilum elliptic on ventral side, 2.8-3.2 x 1.6-1.8 mm. Surface minute tuberculate, dull, dark-brown. 2n = 48.** Native to Eurasia, disturbed grounds, boundaries, rocks and walls, limestone and serpentine slopes in warmer areas, throughout the Carpathians.

**2824. *Rochelia disperma* (L. fil.) C. Koch, *R. stellulata* Rchb., *R. stellata* Reuss** — Annual, stems 5-20 cm, simple or ramified, flowers in bracteate cymes forming lax, terminal panicles. **Nutlets oblique prolonged, subpyriform, usually unci-form, attached to receptacle for most of their length, 2.3-2.8 x 1.6-1.8 mm. Surface dense waved with bristles on the top, slight lustrous, light-greyish. 2n = 20.** Native to southern and southeastern Europe, rarely on dry stony slopes in uplands. Pl, Ro, Sk.

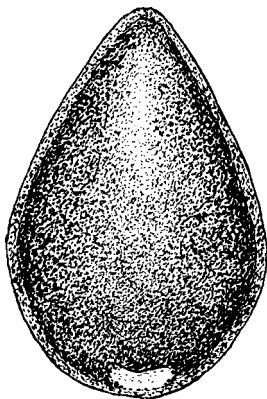
**2825. *Myosotis alpestris* E. W. Schmidt., *M. sylvatica* subs. *alpestris* (F. W. Schmidt) Gams** — Perennial, stems erect, turfed, 5-40 cm high, roughly hairy below, bare above. **Nutlets ovoid to ellipsoid, lateral grooves distinct, ventral side rooflike in the upper half, apex blunt, base broad rounded, 1.6-1.9 x 1.1-1.2 mm. Surface smooth, glossy, brown to black. 2n = 24.** Native to the mountains of Europe, damp stands, rocks, screes, plains, snow lying. Hu, Pl, Ro, Sk, Uk.

**2826. *Myosotis arvensis* (L.) Hill, *M. intermedia* Link** — Annual or biennial, stems erect or ascending, 10-40 cm high, angular, ramified mostly at base. **Nutlets ovoid, dorsal side slight convex, ventral indistinct rooflike, apex blunt pointed, with ellipsoid hilum at base, around with sharp, thin rim, 1.2-1.4 x 0.7-0.9 mm. Surface smooth, glossy, glabrous, blackish-brown. 2n = 52.** Native to Eurasia, fields, fallows, disturbed grounds, boundaries, pastures, light forests and shrubberies; throughout the Carpathians.

**2827. *Myosotis caespitosa* Schultz, *M. lingulata* Lehm., *M. laxa* subsp. *caespitosa* (Schultz.) Hyl. ex Nordh.** — Annual up to biennial, stems erect, rarely ascending, branched at base, 15-45 cm high, appressed hirsute. **Nutlets ovoid, biconvex, margin narrowly rimmed, apex blunt acute, bottom ± truncate, with roundish hilum, 1.4-1.6 x 1-1.1 mm. Surface glabrous, glossy, dark-brown. 2n = 88.** Native to Europe, wet meadows, water banks, stripped pond bottoms; nearly in all Carpathian regions.

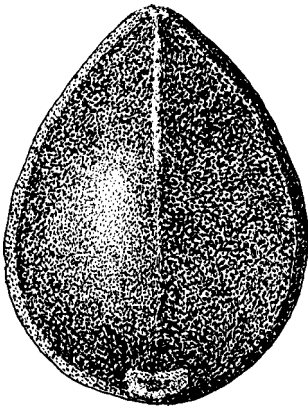
**2828. *Myosotis decumbens* Host, *M. frigida* (Vestergren) Á. et D. Löve** — Perennial, stems ramified from the base, procumbent or ascending, up to 40 cm high. **Nutlets ovoid, slight compressed, rim around, dorsal side convex, ventral rooflike in the upper half, attachment hilum reniform, 1.8-2 x 1.3-1.5 mm. Surface smooth, glossy, black. 2n = 32.** Native to Europe, mainly in mountains of light forests. Pl, Ro, Sk.

**2829. *Myosotis discolor* Pers., *M. collina* Hoffm., *M. versicolor* (Pers.) Sm.** — Annual, stems slender, erect, 5-30 cm high, simple or branched at the base. **Nutlets ovoid, slight compressed, ventral side rooflike and with narrow rim in the upper half, apex blunt pointed, 1-1.2 x 0.7-0.8 mm. Surface faint waved, glossy, dark-brown. 2n = 72.** Native to Europe, dry light and shrubby forests, forest steppes, dry grassy slopes, sandbanks, fallows. Hu, Mo, Pl, Ro, Sk, Uk.



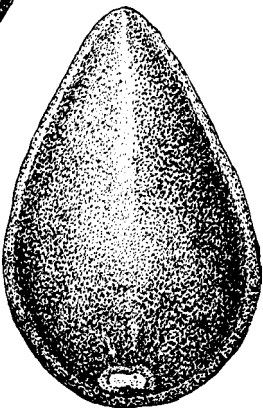
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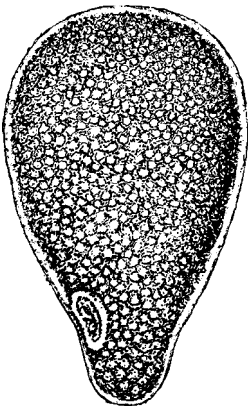


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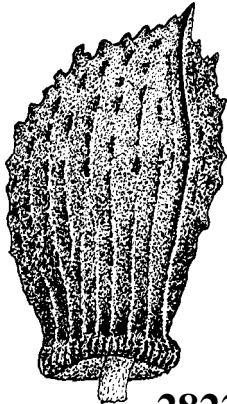
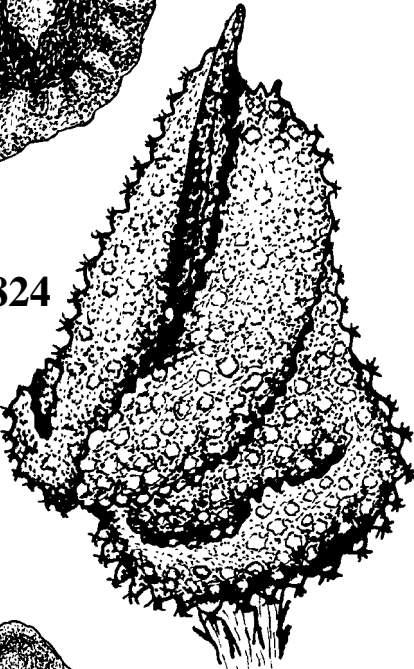
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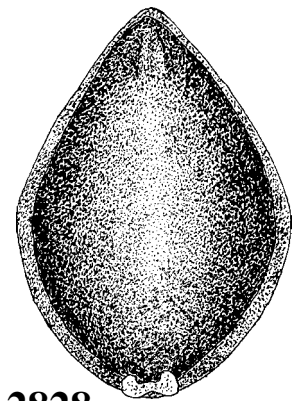
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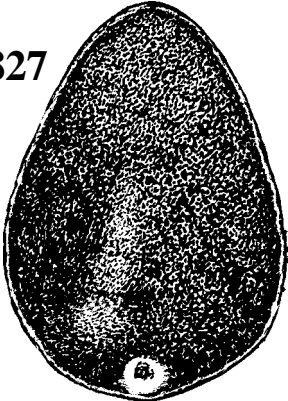


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**2830. *Myosotis nemorosa*** Besser, *M. strigulosa* Rchb., *M. palustris* subsp. *nemorosa* (Besser) Jáv. — Biennial up to perennial, stems erect, 20-60 cm high, angular to winged, branched, hirsute above. **Nutlets ovoid, apex blunt, bottom broader, truncate, with reniform hilum, 1.4-1.6 x 1.2-1.3 mm. Surface glabrous, lustrous, black. 2n = 22.** Native to Eurasia, in wet meadows, springheads, moist woods, in montane zone, at altitudes up to 2000 m. Hu, Ro, Sk, Uk.

**2831. *Myosotis palustris*** (L.) Nath., *M. scorpioides* L. — Perennial, stems ascending up to erect, 20-100 cm high, hirsute below, angular, ramified. **Nutlets ovoid, rim around, dorsal side slight convex, lateral slight rooflike, apex blunt, with roundish hilum at base, 1.5-1.7 x 0.9-1.1 mm. Surface glossy, smooth, blackish-brown. 2n = 64, 66.** Native to Eurasia, wet meadows, banks of streams, ditches, wet woodlands, from lowland up to subalpine zones; throughout the Carpathians.

**2832. *Myosotis ramosissima*** Rochel ex Schult., *M. collina* auct. non Hoffm. — Annual, stems 5-25 cm high, bluntly angular, erect, unramified or only at base. **Nutlets ovoid, with narrow distinct rim, dorsal side slight convex, ventral slight rooflike, apex pointed, 1.2-1.5 x 0.8-1 mm. Surface smooth, glossy, pale-brown up to brown. 2n = 48.** Native to Europe, dry sunny pastures, shrubby slopes, forest steppes, stony and sandy places; in all Carpathian territories.

**2833. *Myosotis sparsiflora*** Mikan et Pohl, *M. sepium* Besser — Annual or biennial, stems 10-40 cm high, slender ascending, branched, hirsute at base. **Nutlets ovoid, marginal rim broader, blunt acute, with tongue-shaped tag at the bottom, with large white hilum, 2.4-2.6 x 1.6-1.9 mm. Surface glabrous, glossy, pale to dark-brown. 2n = 18.** Native to Eurasia, shady, moist leafy lowland woods, shrubs, coastal stands of upland and submontane zones; all Carpathian regions.

**2834. *Myosotis stricta*** Link ex Roem. et Schult., *M. verna* Opiz, *M. arenaria* Schrad. — Annual, stems 5-25 cm high, ramified at base, scarcely hirsute below. **Nutlets ovoid, dorsal side slight convex, ventral rooflike and distinct rimmed in the upper half, apex acute, bottom part indistinct rimmed with broad hilum, 1-1.3 x 0.6-0.8 mm. Surface smooth, high lustrous, yellowish- to dark-brown. 2n = 48.**

Native to Eurasia, dry sunny pastures, shrubby slopes, forest steppes, sandbanks; throughout the Carpathians.

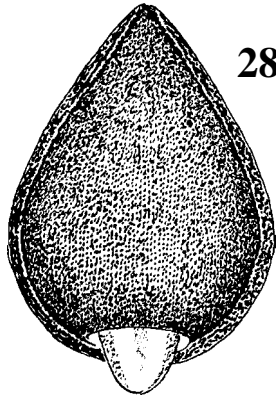
**2835. *Myosotis sylvatica*** Ehrh. ex Hoffm. — Biennial up to perennial, softly hirsute, stems shortly ascending or erect, 10-50 cm high, ramified. **Nutlets ovoid, dorsal side convex, ventral rooflike, rimmed around in the upper half, apex blunt pointed, 1.5-1.9 x 1.1-1.3 mm. Surface smooth, dark-brown, mostly black. 2n = 18.** Native to Eurasia, woodlands, mountain pastures, alpine mats, porous damp soils; throughout the Carpathian regions.

**2836. *Lappula heterocantha*** (Ledeb.) Borbás — Annual, densely appressed hirsute, stems erect, branched above, 15-75 cm high. **Nutlets obovoid, dorsal side with longitudinal rib, margin with 3 rows of unciform spines which are dilated, flattish and united at the base, 2.4-2.8 x 1.9-2.3 mm. Surface papillose-tuberculate, dull, grey. 2n = 48.** Native to the central and southern Europe, scrubs, grasslands, dry, rocky places. Hu, Pl, Ro, Sk, Uk.

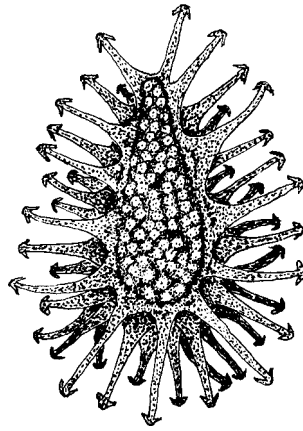
**2837. *Lappula patula*** (Lehm.) Menyh., *L. marginata* (M. Bieb.) Gürke — Annual, stems erect, stiff, 10-30 cm high, ramified at base, with dense hairs. **Nutlets depressed ovoid-pyriform, ventral and dorsal sides tuberculate or verrucose, margin hem bearing a single row of c. 2 mm long unciform spines, 2.3-2.5 x 1.3-1.5 mm. Surface dark-brown, glochidia paler.** Originally growing in central Asia; rarely hauling into the Carpathians, steppes, hills, field margins, roadsides, waste grounds. Hu, Mo, Ro, Sk, Uk.

**2838. *Lappula semicincta*** (Stev.) M. Popov, *Echinosperrum semicinctum* Ledeb. — Annual, stems erect, 15-30 cm high, simple scarcely hirsute, leaves lanceolate. **Nutlets ovoid-trigonal, dorsal side covered with unciform spines united at the margin, ventral side slight convex with central longitudinal rib, 2.1-2.5 x 1.4-1.6 mm. Surface colliculate, dull, greyish-brown. 2n = 48.** Native to Eurasia, on stony and sandy slopes and stony screes. Ro, Sk, Uk.

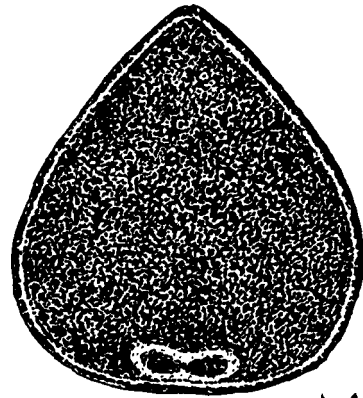
**2839. *Lappula squarosa*** (Retz) Dumort., *L. myosotis* Moench, *L. echinata* Fritsch — Annual to biennial, stems erect, 10-50 cm high, often ramified, hirsute. **Nutlets trigonal-ovoid, flattish, margin with 2-3 rows of unciform prickles, upper part minute tuberculate, flattish at the base, 3.6-4.5 x 2.8-3.2 mm (without unciform prickles). Surface greyish. 2n = 48.** Native to Eurasia, cultivated fields



2833

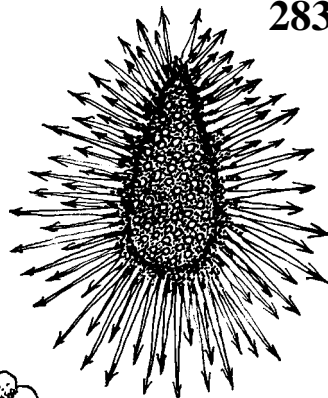
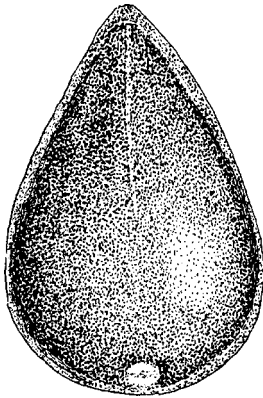


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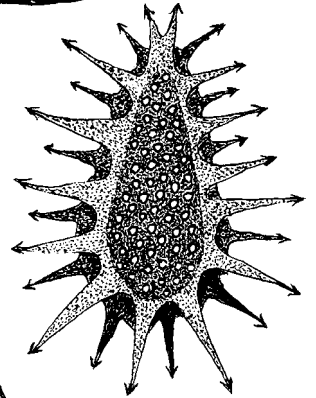


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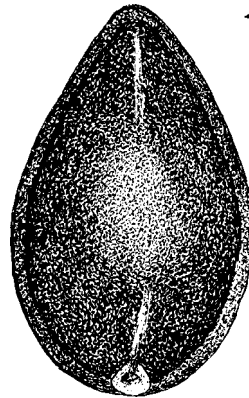
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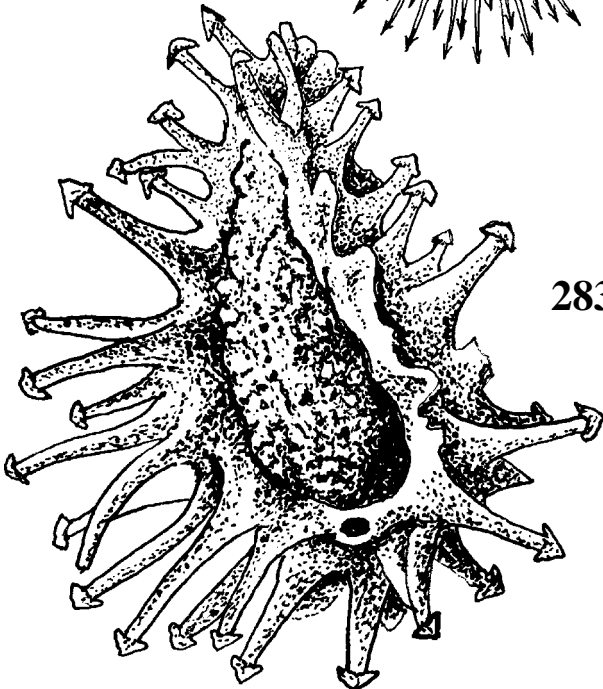
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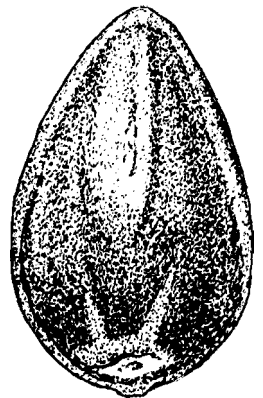
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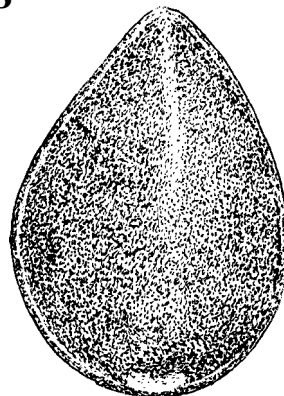
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and other dry disturbed habitats; in all Carpathian regions.

**2840. *Hackelia deflexa*** (Wahlenb.) Opiz, *Lappula deflexa* (Wahlenb.) Garcke — Annual or biennial, stems erect or ascendent, 10-80 cm high, on base ramified. **Nutlets ovoid, trigonous, lateral compressed, dorsal side convex, with flat granulate area in the upper part, the rest of area covered with unciform prickles which are dilated, flattish and united at the base, ventral side flat with rib in the middle, 2.5-3.2 x 1.8-2.2 mm. Surface brown. 2n = 24.** Native to Eurasia, stony forest slopes and shrubberies. Mo, Ro, Sk, Uk.

**2841. *Omphalodes linifolia*** (L.) Moench, *Cynoglossum linifolium* L. — Annual, stems erect, simple or ramified from the base, 8-40 cm high. **Nutlets oval-globose to discoid, bare, with the lobed, dentate hem, mostly incurved, forming an umbilicus, 3.1-3.7 x 3.1-3.7 mm. Surface glabrous or hirsute, dull or slight lustrous, pale- to dark-brown. 2n = 28.** Native to the Mediterranean, dry open habitats, orchards and roadsides. Ro, Uk.

**2842. *Omphalodes scorpioides*** (Haenke) Schrank. — Annual, stems procumbent, ascendent, 15-40 cm, branched from the base, scarcely hirsute. **Nutlets depressed-globose to discoid, hem erect or incurved to form an umbilicus, 2.6-3 x 2.6-3 mm. Surface smooth or hairy, dark-brown to black, wing pale-brown to white. 2n = 24.** Native to Eurasia, shady forests and shrubberies, lowland wet and sloppy woodlands, warmer areas; in all Carpathian territories.

**2843. *Omphalodes verna*** Moench — Perennial, stems procumbent up to creeping, with rooting down shoots, 5 to 40 cm high. **Nutlets ovate to elliptic, hem ciliate, forming an umbilicus, 3.6-4 x 2.6-2.8 mm. Surface smooth, pale- to dark-brown. 2n = 42, 48.** Native to southern Europe, wet mountain forests; sometimes cultivated for ornament and rarely naturalized. Hu, Pl, Ro, Sk, Uk.

**2844. *Cynoglossum creticum*** Mill., *C. pictum* Ait. — Biennial, stems pubescent, 20-60 cm high, hirsute, to tomentose. **Nutlets ovate or drop-shaped, without a distinct border besides a small hilum, all surface densely covered with short unciform prickles, 5.8-6.2 x 4.6-5 mm. Surface of the hilum tuberculate, dull, grey or greyish-brown.** Native to the

Mediterranean, disturbed grounds, fields and road ravines. Ro, Uk.

**2845. *Cynoglossum germanicum*** Jacq., *C. sylvaticum* Haenke — Biennial, stems erect, 30-50 cm high, scarcely hirsute. **Nutlets in shape and other characteristics very similar to *C. officinale*, 5-6 x 4-5 mm. 2n = 24, 48.** Native to Europe, semishady and shady forest margins and dumps. Mo, Pl, Ro, Sk, Uk.

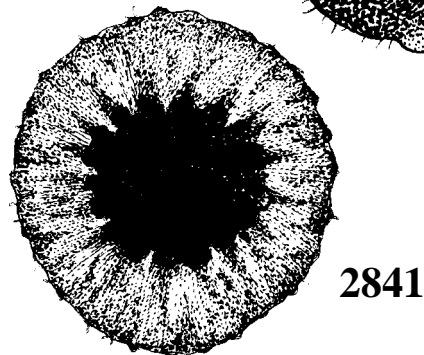
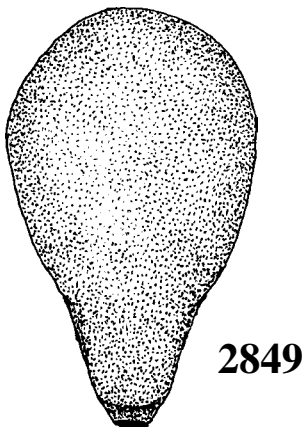
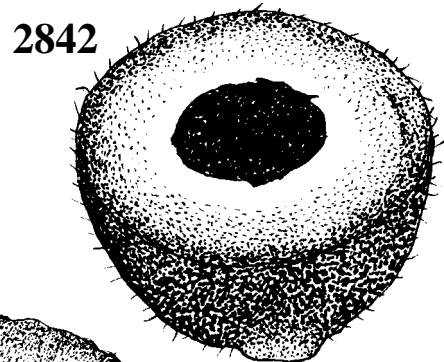
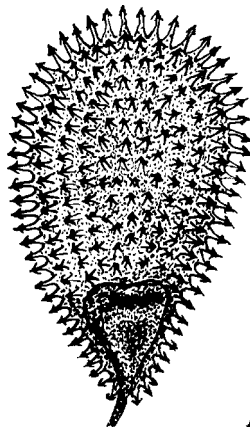
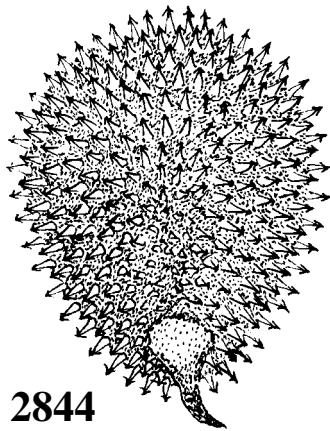
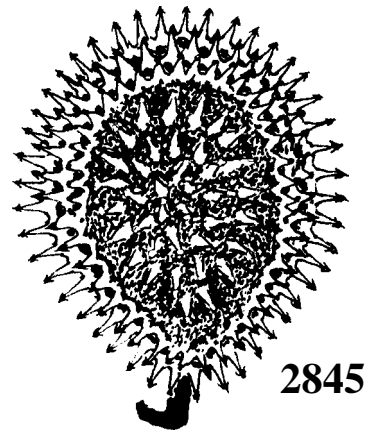
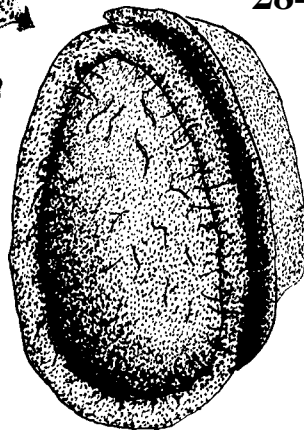
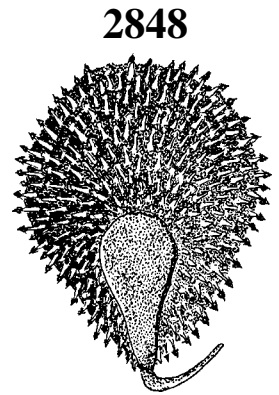
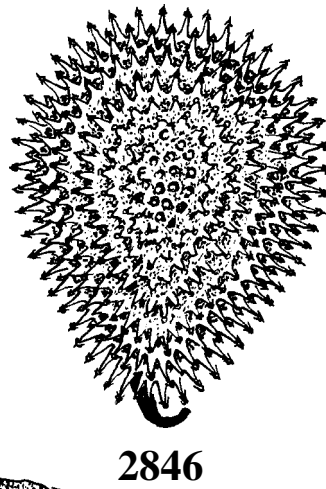
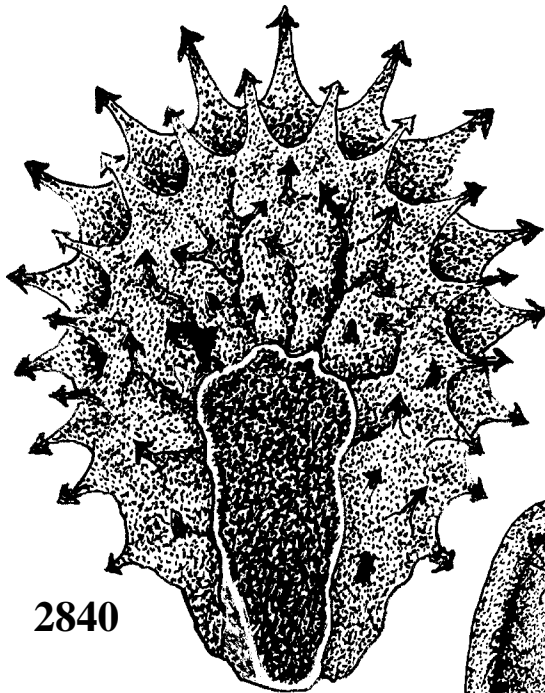
**2846. *Cynoglossum hungaricum*** Sink., *C. montanum* Hoejer non L. — Biennial, stems 20-50 cm high, hirsute. **Nutlets ovoidal or drop-shaped, besides the small hilum at base of ventral side all surface densely covered with short unciform prickles, 7-8.2 x 5.5-6.5 mm. Surface of the hilum rugose, dull, grey or greyish-brown. 2n = 24.** Native to Eurasia, sunny pastures, stony slopes, karst rocks, dry open habitats. Hu, Ro, Sk, Uk.

**2847. *Cynoglossum montanum*** L., *C. nebrodense* Guss. — Biennial or annual, stem (mostly single) erect, slender, 20-40 cm high, hirsute to tomentose, downy and ramified above. **Nutlets ovoidal, immarginate, dorsal side convex, less densely spurred than lateral and central surfaces, with or without scattered small tubercles between the unciform prickles, 6-7 x 4.4-5 mm. Surface grey or brownish-grey.** Native to Euro-Siberia, scrubs, steppes, rocky slopes, meadows and mountain woods. Mo, Uk.

**2848. *Cynoglossum officinale*** L. — Annual, stem erect, 30-80 cm high, angular, densely leafy, hirsute. **Nutlets ovoid or drop-shaped, besides the hilum on ventral side all surface dense covered with short unciform prickles, 5.3-5.7 x 4.6-5 mm. Surface rugose, dull, greyish-brown. 2n = 24, 48.** Native to Eurasia, dry open habitats, gravelly river terraces, grassy places; throughout the Carpathians.

### 135. PEDALIACEAE

**2849. *Sesamum indicum*** L., *S. orientale* L. — Annual, stems up to 30-60 cm high, erect, simple or branched, with grooved stems, often pubescent, fruits many-seeded loculi. **Nutlets obovate, lateral compressed, rounded bottom part narrowed, 3-3.4 x 1.8-2 mm. Surface smooth, faint lustrous, yellowish-white or black.** Originally spread from tropical Africa and widely grown in India; locally naturalized in the southeastern Carpathians and cultivated as oil-yielding plant. Mo, Ro, Uk.



## 136. CALLITRICHACEAE

**2850. *Callitriche cophocarpa*** Sendtner, *C. polymorpha* Lännr. — Perennial, floating submerged stems, up to 25 cm long, with stelliform hairs. **Fruits schizocarps, each of 4 nutlets obovate, unwinged, only keeled or obtusely angular, 1.1-1.4 x 0.6-0.8 mm. Surface reticulate-foveate, brown. 2n = 12.** Native to Euro-Siberia, in slow-flowing waters, from lowland to subalpine zones. Hu, Pl, Ro, Sk, Uk.

**2851. *Callitriche hamulata*** Kütz ex Koch — Annual to perennial, submerging or swampy, stems  $\pm$  flattish, 20-50 cm long, with stelliform hairs. **Fruits schizocarps, each of 4 nutlets obovate or elliptic, mericarp narrow winged, 1.2-1.5 x 0.6-0.7 mm. Surface reticulate-foveate, dull, brown. 2n = 38, 40.** Native to Europe, stagnant, base-poor, cool, slow-flowing waters and lakes. Pl, Ro, Uk.

**2852. *Callitriche hermaphroditica*** L., *C. autumnalis* L. — Perennial, only submerged stems, 15-50 cm long, without hairs. **Fruits schizocarps, each of 4 nutlets subellipsoid, compressed, sessile, mericarp usually broadly winged on apex, 1.8-2.2 x 0.7-0.9 mm. Surface fine reticulate-foveate, greenish or greenish-brown. 2n = 6.** Native to northern Europe, stagnant or slow-flowing waters, lakes, channels and rives. Pl, Ro, Uk.

**2853. *Callitriche obtusangula*** Le Gal — Perennial, floating submerged stems up to 60 cm long, swampy, up to 10 cm long. **Fruits schizocarps, each of 4 nutlets ellipsoid, apex convex with scarce distinct narrow margins, 1.6-2 x 0.6-0.8 mm. 2n = 10.** Native to Europe, fresh or brackish, usually slow-flowing waters. Hu.

**2854. *Callitriche palustris*** L., *C. verna* L., *C. vernalis* Koch — Submerged - perennial, swampy - biennial, floating submerged stems up to 40 cm long. **Fruits schizocarps, each of 4 nutlets obovate or elliptic, mericarp winged only at apex, 0.9-1.1 x 0.4-0.5 mm. Surface reticulate-foveate, slight lustrous, dark- or blackish-brown. 2n = 20.** Native to Eurasia, puddles, ditches, ponds, shallow and still waters. Hu, Mo, Pl, Ro, Sk, Uk.

**2855. *Callitriche platycarpa*** Kütz — Perennial, water plant, submerged stems up to 40 cm long, much ramified, with stelliform hairs. **Fruits schizocarps, consisting of 4 nutlets, each part suborbicular, mericarps broadly winged at apex, 1.6-2 x 0.8-1 mm. Surface reticulate-foveate, brown. 2n =**

**10.** Native to Eurasia, springs and still or slow-flowing waters, ditches, ponds. Hu, Pl, Ro, Sk.

**2856. *Callitriche stagnalis*** Scop. — Annual to perennial, submerged stems up to 70-100 cm long, with stelliform hairs. **Fruits schizocarps, nutlets suborbicular, deeply grooved between the divergent mericarps, mericarps broadly winged, 1.6-2 x 0.8-1 mm. Surface fine reticulate-foveate, pale-brown. 2n = 10.** Native to Europe, springs, still or slow-flowing waters, marshy places, Pl, Ro, Uk.

## 137. VERBENACEAE

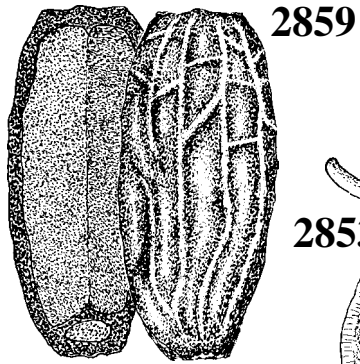
**2857. *Verbena bonariensis*** L. — Perennial, stems 4-angular, roughly hairy, without leaves above, little branched stems up to 200 cm high, scabrid at the angles. **Nutlets prolonged cylindric, dorsal side (right) convex with 3-5 ribs, ventral side (left) rooflike, 1.7-1.9 x 0.5-0.7 mm. Surface densely whitish verrucose, dorsal side reddish-brown. 2n = 28.** Originally growing in South America; into the Carpathians rarely hauling with wool on roadsides and gravelly waste places.

**2858. *Verbena hybrida*** hort. — Plant with stems 25-75 cm high, hybrid of the North American species with fragrant flowers. **Nutlets prolonged cylindric, dorsal side (right) convex with longitudinal and transverse ribs, ventral side (left) rooflike, usually bigger than the nuculas of the parents (*V. canadensis* (L.) Britton x *V. peruviana*), 4.5-5 x 0.9-1.1 mm. Surface pale-, orange- or dark-brown, ventral side white or pale-brown verrucose.** Often cultivated as ornamental in gardens, sometimes escaping. Hu, Mo, Sk, Uk.

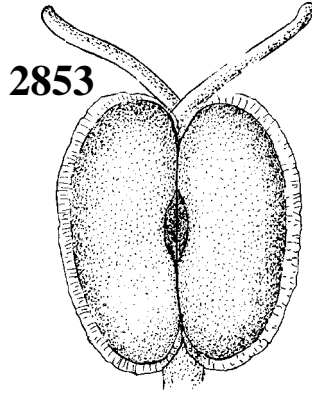
**2859. *Verbena officinalis*** L. — Perennial, stems erect, 30-60 cm high, 4-angular, grooved, stout, branched above. **Nutlets prolonged fusiform, trigonous-prismatic, dorsal side (right) convex, with 4-5 brown ribs, ventral side (left) rooflike, 1.7-2 x 0.7-0.8 mm. Surface ventral side whitish verrucose. 2n = 14.** Native to Eurasia, today quasi-cosmopolitan, weedy places, along roadsides, fallows, nitrogenous soils; throughout the Carpathians.

**2860. *Verbena peruviana*** (L.) Druce, *V. chamaedrifolia* Juss. — Perennial, stems procumbent or ascendent. **Nutlets prolonged oval, often curved, dorsal side (right) convex with reticulate ribs, pale- to dark-brown, ventral side (left) narrow, rooflike, fine verrucose, whitish, 4-4.6 x 1.1-1.3 mm. Surface reticulate-foveate, dull, yellowish to pale-brown.**

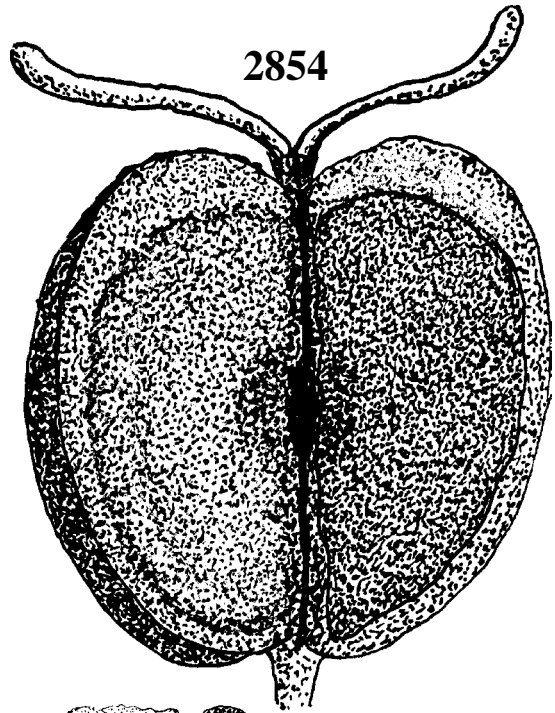




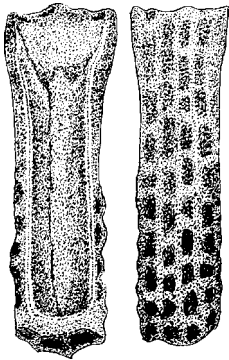
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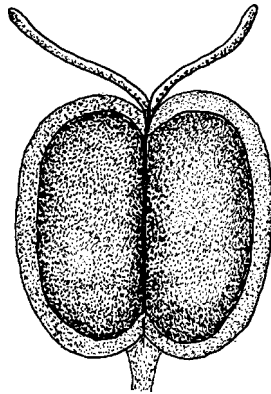
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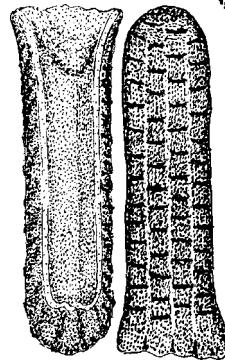
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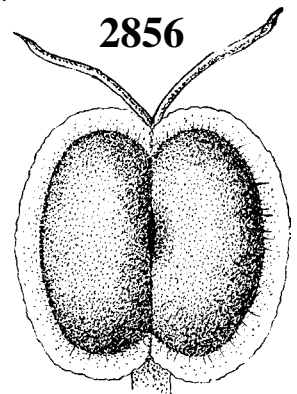
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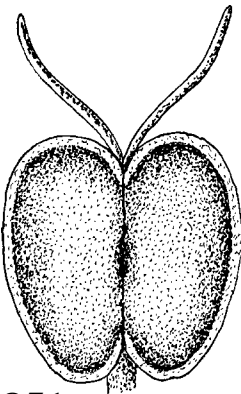
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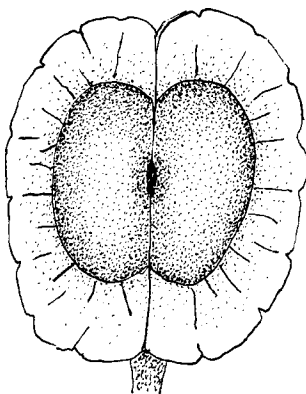
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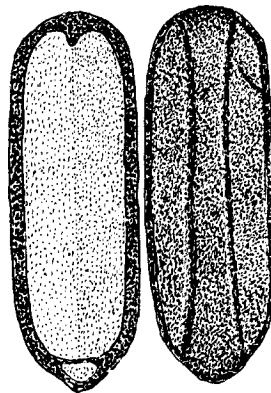
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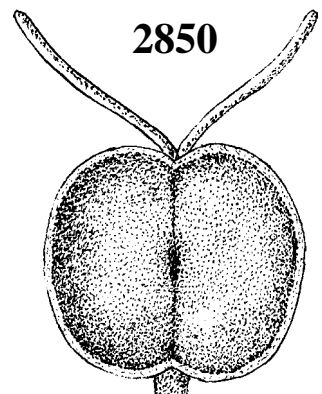
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**2n = 10.** Native to South America; in the Carpathians rarely cultivated for ornament in gardens.

**2861. *Verbena supina* L.** — Annual, stems 10-40 cm high, prostrate, ascendent, ramified from the base, hirsute. **Nutlets cylindric, dorsal side (right) convex, smooth or hairy, ventral side (left) rooflike, verrucose, 1.9-2.1 x 0.6-0.7 mm.** Surface whitish (ventral side) and pale-brown (dorsal side), lustreless. Native to Eurasia, near waters, damp sands and wet saline soils, in lowlands and uplands. Hu, Mo, Ro, Uk.

**2862. *Verbena venosa* (Gillies) Hooker, *V. rigida* Sprengel** — Perennial, scabrid-pubescent, with stiff, erect or ascending, few branched stems, up to 60 cm high. **Nutlets elliptic, dorsal side (right) convex, with 3-4 longitudinal and or some lateral broad ribs, ventral side (left) rooflike, flat, 1.6-2 x 0.9-1.1 mm.** Surface of dorsal side waved, reddish-brown, ventral side papillose-tuberculate, ochraceous. Native to South America, roadsides, waste places, damp or sandy grounds; in the Carpathians rarely cultivated for ornament in gardens.

**2863. *Lantana camara* L., *L. aculeata* L., *L. hybrida* L.** — Shrub, stems 30-100 cm high, hirsute, ramified, bare or spiny. **Nutlets ovate, apex tapering, ventral side enclosed in exocarp, 4.3-4.7 x 3.1-3.5 mm.** Surface smooth, glabrous, dull, pale-brown. Originally growing in tropical America, naturalized as an ornamental in southern Europe as a pure species and in many hybrid forms. Ro.

**2864. *Vitex agnus-castus* L.** — Shrub, stems 1-3 m high, young shoots prolonged, first tomentose, 4-angular. **Nutlets spherical, 3.8-4.1 x 3.8-4.1 mm.** Surface dorsal side smooth, blackish, ventral enclosed in greyish-brown exocarp, with burning taste. Originally growing in central Asia, on banks of streams; cultivated for its characteristics aroma and for decoration, mostly in southern Europe; in the Carpathians rare. Leaves with high contents of vitamin C (39-118 mg %). Hu, Mo, Ro, Uk.

### 138. LAMIACEAE

**2865. *Ajuga genevensis* L., *Bugula genevensis* Scop., *Teucrium genevensis* Crantz** — Perennial, stems ascendent to erect, 10-40 cm high, subglabrous or lanate-villous, simple. **Nutlets obovate to elliptic, dorsal side convex, 2/3 of the bottom ventral side belonging to hilum, 2.2-2.6 x 1.4-1.6 mm.** Surface faint lustrous, fine reticulate-foveate, brown to

greyish-brown. **2n = 32.** Native to Eurasia, dry meadows, shrubberies, forests, steppe slopes, riverbanks; in all Carpathian regions.

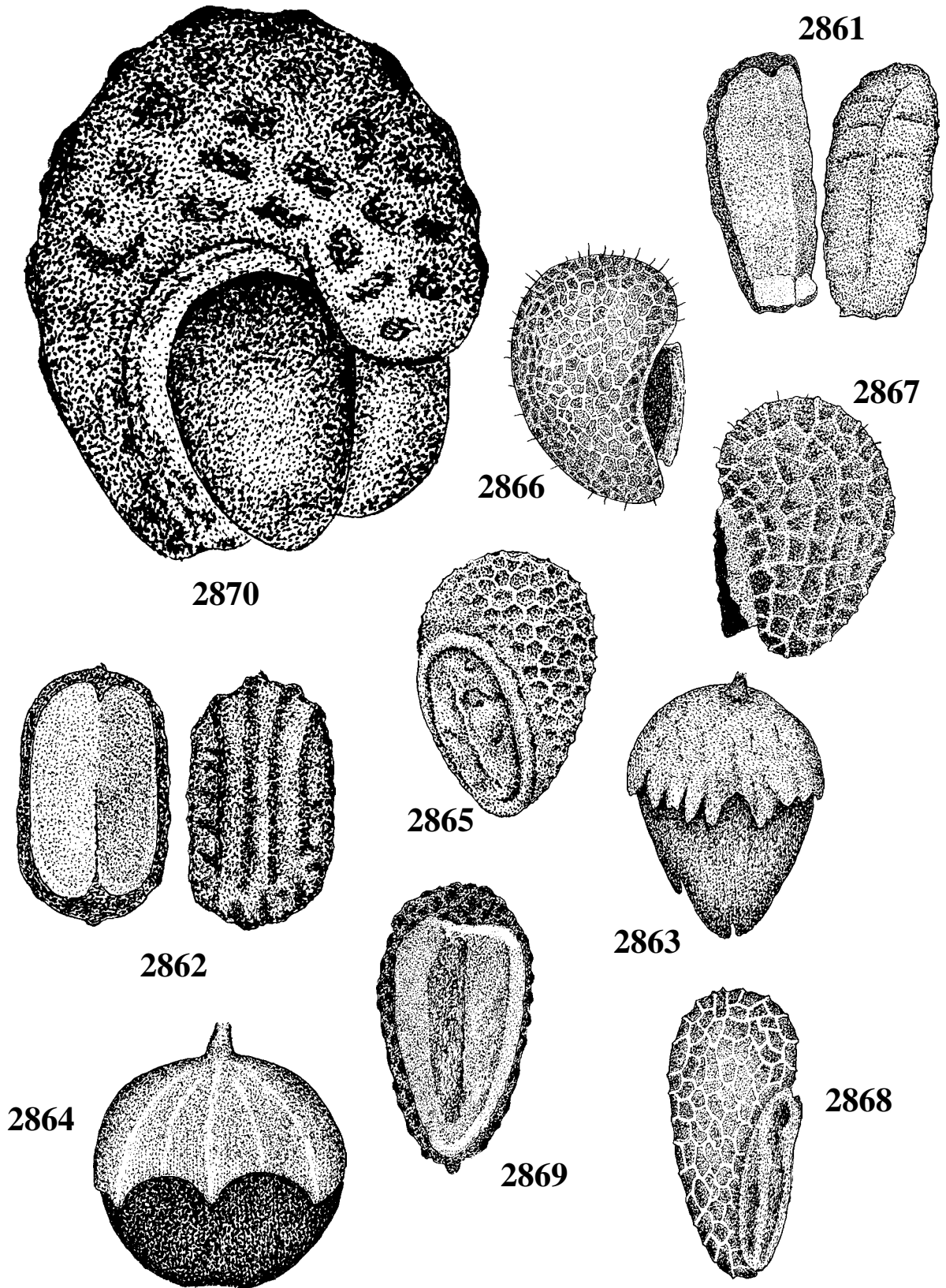
**2866. *Ajuga pyramidalis* L., *Teucrium pyramidalis* Crantz** — Perennial, stems erect, 5-30 cm high, subglabrous or lanate-villous, simple, relatively thick. **Nutlets obovate or elliptic, dorsal side convex, hilum on the bottom 2/3 of ventral side, 2-2.5 x 1.3-1.6 mm.** Surface reticulate-foveate, lustrous, glabrous, yellowish-brown. **2n = 32.** Native to Europe, subalpine meadows and pastures; throughout the Carpathians.

**2867. *Ajuga reptans* L., *Teucrium reptans* Crantz** — Perennial, stems ascendent or erect, unbranched, 10-40 cm high, 4-angular, glabrous or downy. **Nutlets obovate, ventral base with large hilum, 2.1-2.5 x 1.3-1.5 mm.** Surface dull or faint lustrous, reticulate-foveate, dark-brown. **2n = 32.** Native to Europe, wet meadows, deciduous forests, shrubberies, clearings; in all Carpathian regions.

**2868. *Chamaepitys chia* (Schreb.) Holub, *Teucrium chamaepitys* L., *Ajuga chia* Schreb.** — Annual, stems ramified from base, 5-30 cm high, procumbent to erect, obtusely 4-angular, villous. **Nutlets obovate to elliptic, ventral side 2/3 of bottom surface belonging to hilum, 2.5-3 x 1.1-1.4 mm.** Surface dull, reticulate-foveate, greenish- or greyish-brown. **2n = 28.** Native to Eurasia, fallows, fields, waste places, saline soils, vineyards; throughout the Carpathians.

**2869. *Phleboanthe laxmannii* (L.) Tausch, *Teucrium laxmannii* L., *Ajuga laxmannii* (L.) Benth** — Perennial, stems 20-50 cm high, unbranched. **Nutlets obovate to elliptic, dorsal side convex, ventral side mostly flat, forming the hilum, 3.5-4 x 1.9-2.3 mm.** Surface mostly dull, glabrous, reticulate-foveate, pale- to dark-brown. **2n = 62.** Native to Eurasia, karst slopes, steppes and steppe woodlands, shrubberies. Mo, Pl, Ro, Sk, Uk.

**2870. *Teucrium botrys* L.** — Annual (biennial), stems erect, 10-30 cm high, often reddish, branched, densely glandular downy to villous, aromatic. **Nutlets mostly spherical, with large hilum on ventral side, 1.5-1.9 x 1.3-1.5 mm.** Surface reticulate-foveate, dull, dark-brown. **2n = 32.** Native to Europe, dry stony places, sunny grassy slopes, screes, embankments, vineyards, somewhat calcareous grounds. Hu, Pl, Ro, Sk.



**2871. *Teucrium chamaedrys* L., *T. officinale* Lam., *Chamaedrys officinalis* Moench** – Semishrub, stems ascendent, 10-50 cm high, woody at base, densely leafy, glandular-hirsute. **Nutlets mostly globose to elliptic, with large hilum on ventral side of the bottom part, 1.5-1.9 x 1.3-1.5 mm. Surface indistinct reticulate-foveate, faint lustrous, glabrous, blackish-brown. 2n = 60.** Native to Eurasia, dry sunny slopes and rocks, forest steppes of warmer areas; throughout the Carpathians.

**2872. *Teucrium marum* L.** – Semishrub, to 50 cm high, stems slender, white-downy. **Nutlets obovate to elliptic, hilum with longitudinal rib on bottom of ventral side, 1.6-2 x 1-1.3 mm. Surface reticulate-foveate, hairy, dark-brown.** Native to the Mediterranean; in the Carpathians cultivated as ornamental in gardens, uniquely naturalized.

**2873. *Teucrium montanum* L., *Ponium montanum* Mill.** – Semishrub, stems woody at base, procumbent, white-downy, tufty, ramified. **Nutlets obovate to elliptic, with large hilum on bottom ventral side, 1.6-2 x 0.9-1.1 mm. Surface of dorsal side indistinct reticulate-foveate, faint lustrous, glabrous, brown to blackish-brown. 2n = 26, 30, 60.** Native to Europe, sunny, stony slopes, stony and rocky steppes of nearly all Carpathian regions.

**2874. *Teucrium polium* L.** – Semishrub, stems 10-40 cm high, densely hirsute. **Nutlets elliptic or prolonged obovate, dorsal side convex, ventral with large hilum, 1.8-2.2 x 1.2-1.4 mm. Surface reticulate-foveate, dull or faint lustrous, pale- to dark-brown, scarce hairy. 2n = 26, 32, 78.** Native to southern Europe, arid places of lowlands, hauling into central Europe. Mo, Ro, Uk.

**2875. *Teucrium scordioides* Schreb., *T. lanuginosum* Hoffm. et Link** – Perennial, stems erect, sometimes branched at base, 10-60 cm high. **Nutlets spherical, with large hilum, 0.9-1.1 x 0.7-0.8 mm. Surface reticulate-foveate, dull, dark-brown. 2n = 32.** Native to southeastern Europe, Asia Minor and northern Africa, moist and marshy stands. Mo, Ro, Uk.

**2876. *Teucrium scordium* L.** – Perennial, stems ascendent, 10-50 cm high, simple or little ramified, densely leafy. **Nutlets elliptic or faint obovate, dorsal side convex, with large hilum on bottom of ventral side, 1-1.3 x 0.8-1 mm. Surface distinctly reticulate-foveate, glabrous, pale- to dark-brown.**

**2n = 32.** Native to Eurasia, wet meadows, overflowed riverbanks of all Carpathian territories.

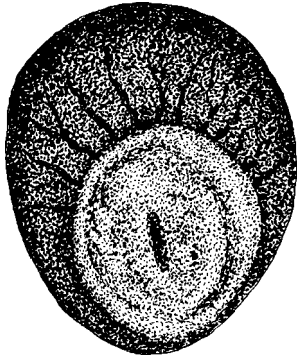
**2877. *Teucrium scorodonia* L., *T. silvestre* Lam., *Scorodonia heteromala* Moench** – Perennial or semishrub, stems downy, erect, 20-100 cm high, branched above, 4-angular. **Nutlets globose to obovate with small hilum on bottom ventral side, 1.3-1.7 x 1.1-1.3 mm. Surface faint foveate, glabrous, dull or faint lustrous, dark-brown to black. 2n = 32.** Native to Europe, light forests, pastures, shrubby forest edges, along railways, formerly cultivated as a honey-bearing plant or hauled to Hu, Pl, Sk.

**2878. *Scutellaria albida* L.** – Perennial, stems 20-35 cm high, erect, simple or little branched above, with short appressed eglandular hairs. **Nutlets elliptic, dorsal side convex, lateral with hilum and noselet, 1.8-2.2 x 1.4-1.6 mm. Surface tuberculate, each tubercle with stellate whitish hair, lustreless, greyish or brownish.** Native to southeastern Europe, rocky stands, light woods and scrub margins. Ro. (?).

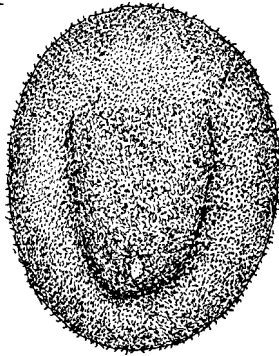
**2879. *Scutellaria alpina* L.** – Perennial, stems woody at base, 15-50 cm high, pubescent, simple or branched, with ascendent twigs. **Nutlets obovate to elliptic, dorsal side convex, ventral ± flattish with tongue-shaped radicle, apex truncate or rounded, 1.6-2 x 1.2-1.4 mm. Surface verrucose, completely covered with whitish hairlets, greyish-ashy, hilum black.** Native to central Europe, Asia Minor and Siberia, rocky and scree sites of mountains, usually calcareous. Ro, Uk.

**2880. *Scutellaria altissima* L.** – Perennial, stems erect, up to 100 cm high, downy, glandular above, simple or little ramified. **Nutlets elliptic to obovate, dorsal side convex, ventral with small whitish hilum, 1.7-2.1 x 1.2-1.5 mm. Surface flatly verrucose, each wart with 3-5 short white hairlets, dull, dark-brown. 2n = 34.** Native to southern Europe, light deciduous forests, shrubberies, forest steppes of lowlands. Hu, Mo, Pl, Ro, Sk, Uk.

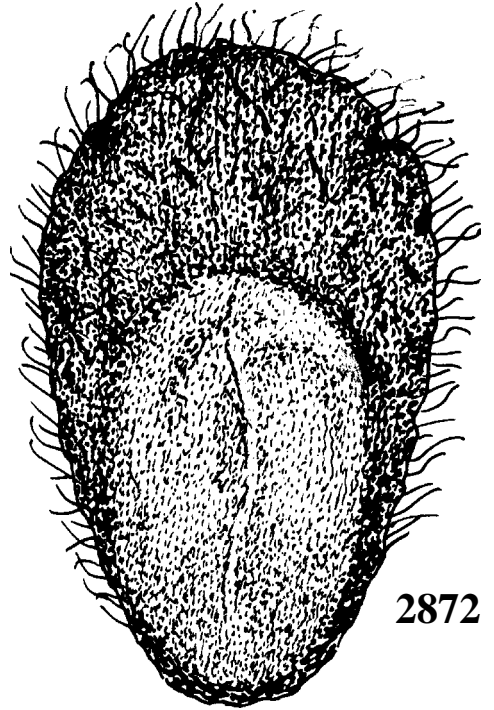
**2881. *Scutellaria columnae* All.** – Perennial, stems erect, 30-100 cm high, simple or ramified. **Nutlets elliptic, dorsal side convex, ventral with small hilum, 1.9-2.5 x 1.5-1.8 mm. Surface flatly verrucose, each wart with stelliform, whitish rosette of hairs, brown to black. 2n = 34.** Native to the Balkan mountains, deciduous woodlands. Hu, Ro.



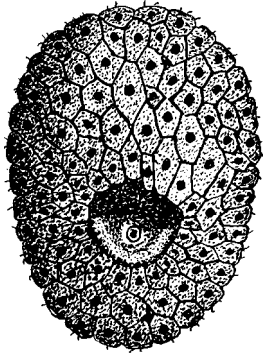
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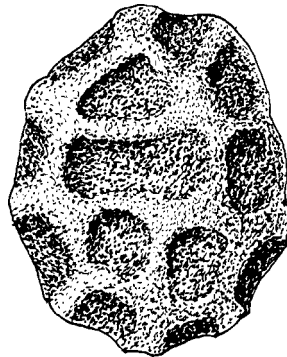
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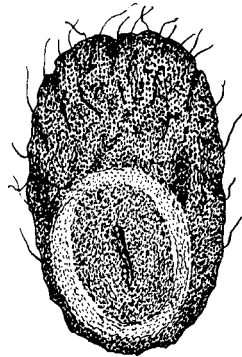
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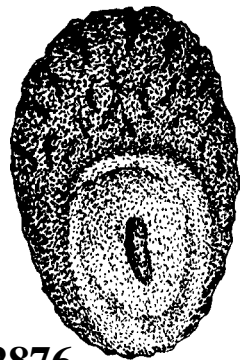
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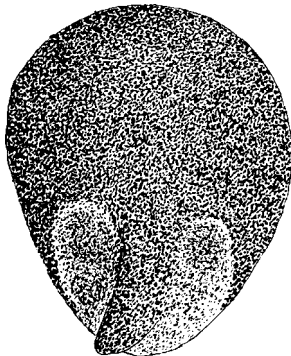
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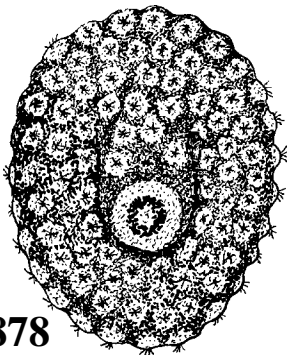
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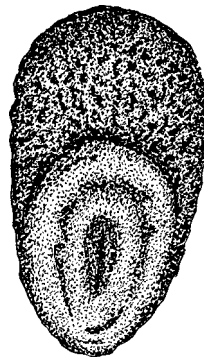
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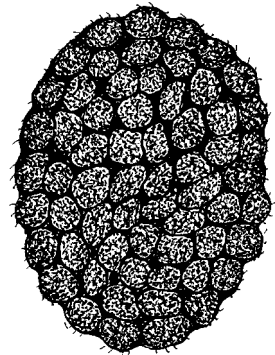
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**2882. *Scutellaria galericulata* L.** — Perennial, stems ascendent or erect, 10-70 cm high, simple or little ramified above, glabrous or downy. **Nutlets spherical to angular-ovate with hilum noselet in the ventral side centre, 1.4-1.6 x 1.2-1.4 mm. Surface dense verrucose, dull, glabrous, yellowish-brown.  $2n = 32$ .** Native to Euro-Siberia, river and pond banks, reed-beds, damp places, sandy or peaty soils of all Carpathian regions.

**2883. *Scutellaria hastifolia* L.** — Perennial, stems erect, 15-40 cm high, simple or little ramified above, glabrous or downy. **Nutlets irregular globose to elliptic, dorsal side convex with longitudinal ribs, ventral with small whitish hilum in the centre, 1.4-1.6 x 1.2-1.4 mm. Surface densely and roughly verrucose, dull, dark-brown.  $2n = 32$ .** Native to Euro-Siberia, damp grasslands, light lowland wet forest overgrown water banks, saline grounds; throughout the Carpathians.

**2884. *Scutellaria orientalis* L.** — Perennial, stems subfrutescent, 7-30 cm high, much ramified from the base, twigs ascending. **Nutlets obovate, dorsal side convex, ventral flattish with tongue-shaped radicle and hilum, 1.6-2 x 1.3-1.5 mm. Surface completely covered with ashy hairlets.** Native to Euro-Siberia, dry rocky, calcareous, loamy, screes. Ro.

**2885. *Scutellaria przewalskii* Juz., *S. orientalis* var. *pinnatifida* auct. non Rechb.** — Perennial, stems 6-20 cm high, branched below, rare above, erect, sparsely hirsute. **Nutlets elliptic or ovate, convexo-convex, hilum large, localized ventral side below, 1.7-2.1 x 1.3-1.5 mm. Surface rough, waved with visible cell-like structure, lustreless, dark-brown.** Native to central Asia, dry steppes, stony slopes, brook- and riverbanks, rarely cultivated in gardens.

**2886. *Scutellaria supina* L., *S. lupulina* L.** — Perennial, stems subfrutescent, 10-45 cm high, simple or ramified, erect or ascendent. **Nutlets obovate, dorsal side convex, ventral  $\pm$  flattish with tongue-shaped radicle, 1.4-1.7 x 1.1-1.3 mm. Surface indistinctly verrucose, completely covered with whitish to dark-ashy hairlets.** Native to eastern Europe, Siberia and Mongolia, stony coasts, meadows and steppes. Ro.

**2887. *Scutellaria velenovskyi* Rech. fil., *S. pichleri* Velen.** — Perennial, stems 20-60 cm high, with both short and long patent eglandular hairs, leaves ovate-triangular, pubescent. **Nutlets elliptic, convexo-**

**convex, 1.5-1.8 x 1.2-1.4 mm. Surface densely covered with white, tightly fitting star hairs, dull, dark-violet.** Native to southwestern Asia; mountain pastures in the Carpathians. Ro.

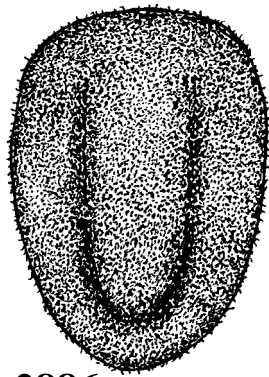
**2888. *Marrubium peregrinum* L.** — Perennial, stems erect, 30-80 cm high, ramified, appressed-tomentose, often woody, densely leafy at base. **Nutlets elliptic, bluntly triangular, dorsal side convex, ventral rooflike, border winged, apex hairy, 2-2.4 x 1.1-1.5 mm. Surface scattered, shallow verrucose, dull, dark-brown, warts black.  $2n = 34$ .** Native to Eurasia, steppe and shrubby slopes, sandy pastures, waste places and dry open habitats. Hu, Mo, Pl, Ro, Sk, Uk.

**2889. *Marrubium praecox* Janka, *M. pestalozzae* Boiss.** — Perennial, stems erect, 30-70 cm high, branched above, tomentose. **Nutlets elliptic, bluntly triangular, apex truncate, base narrowed, dorsal side slight convex, two ventral sides flat, rooflike, apex hairy, 1.8-2.2 x 1-1.2 mm. Surface scattered, shallow verrucose, faint lustrous, brown to black.** Native to southeastern Europe and Asia Minor, dry waste places, fields, hills, roadsides, steppe and stony slopes. Mo, Ro, Uk.

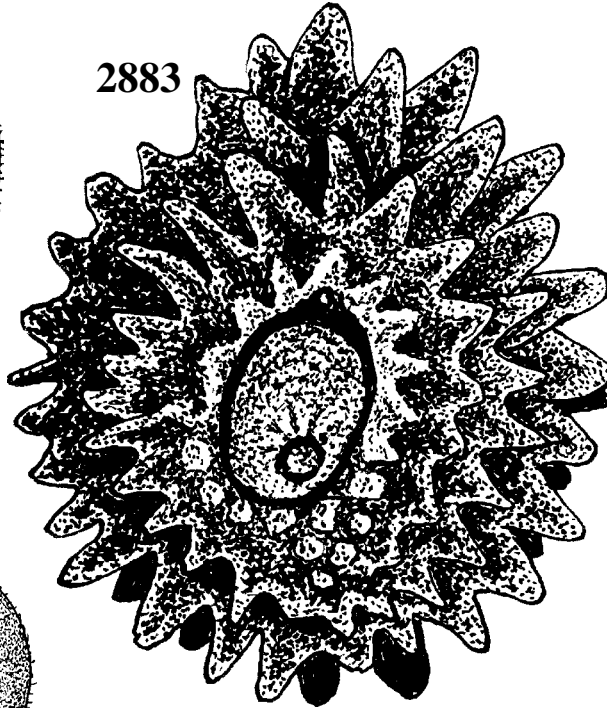
**2890. *Marrubium velutinum* Sibth. et Sm.** — Shrub, stems up to 40 cm, yellowish-tomentose, simple or with short non-flowering branches. **Nutlets elliptic, dorsal side convex, ventral rooflike, both areas flat, 2.4-2.6 x 1.3-1.5 mm. Surface foveolate, lustreless, greyish-brown.** Native to the eastern Mediterranean up to Asia Minor, on mountain rocks; cultivated in the Carpathians, in rock-gardens as an attractive ornamental.

**2891. *Marrubium vulgare* L.** — Perennial, stems erect or ascending, 40-50 cm high, white-lanate, with short unflowering shoots. **Nutlets prolonged obovate to elliptic, dorsal side slight convex, two ventral sides rooflike, apex truncate, 2-2.4 x 1-1.5 mm. Surface scattered, shallow verrucose, dull or faint lustrous, brown or blackish, warts black.  $2n = 34$ .** Native to Eurasia, shrubby slopes and pastures, boundaries, waste places; throughout the Carpathians.

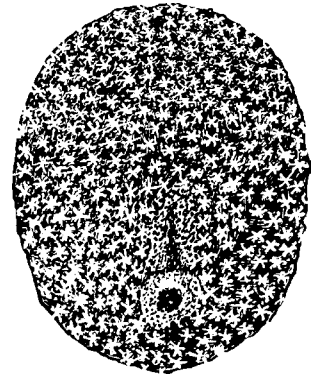
**2892. *Hesiodia montana* (L.) Dumort., *Sideritis montana* L.** — Annual, stems erect or ascendent, 10-30 cm high, simple or ramified from the bases, villous-lanate. **Nutlets triangular, dorsal side convex, two ventral sides flat, rooflike, base narrowed, rounded at the apex, 1.6-2 x 1.1-1.3 mm.**



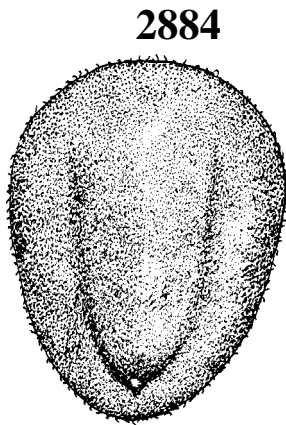
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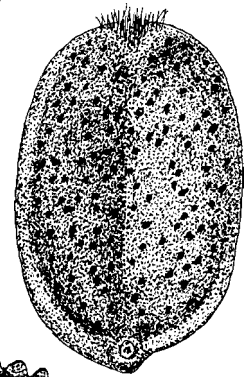
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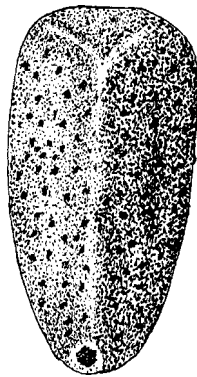
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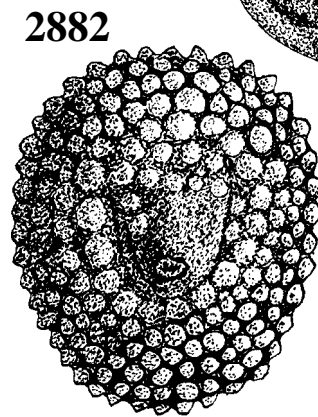
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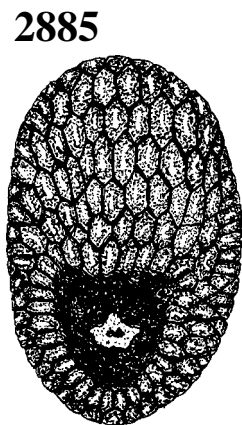
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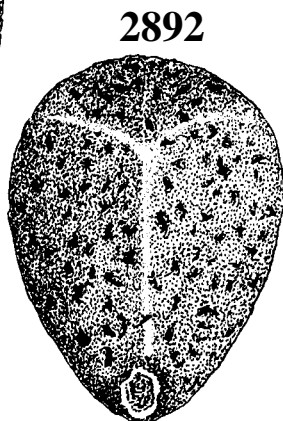
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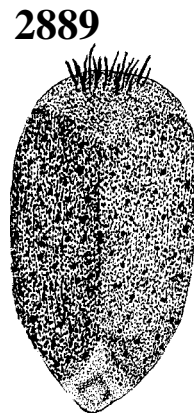
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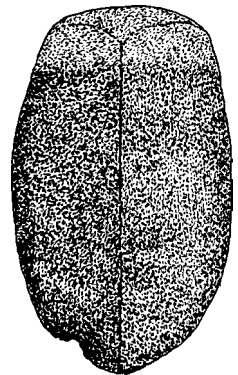
2885



2892



2889



2890



Surface smooth, verrucose, lustrous, pale-brown with dark-brown warts.  $2n = 16, 32$ . Native to south-eastern Europe, sunny stony slopes and sandy fallows. Hu, Mo, Pl, Ro, Sk, Uk.

**2893. *Melittis melisophyllum* L., *M. carpatica* Klokov** – Perennial, stems erect, 20-70 cm high, simple, stout, quadrangular, hispidulous hirsute, seldom little ramified. **Nutlets triangular, dorsal side convex, two ventral sides flat, rooflike, apex truncate and hairy, base narrowed, 3.5-4.1 x 3.4-3.8 mm. Surface nearly smooth, dull, brownish-black.  $2n = 30$ .** Native to eastern, central and southern Europe, shady places in deciduous forests, basic grounds; throughout the Carpathians.

**2894. *Lallemantia iberica* (Stev.) Fisch. et Mey., *Dracocephalum ibericum* Stev.** – Annual to biennial, stems 20-70 cm high, erect, simple or ramified from the base. **Nutlets prolonged triangular, dorsal side slight convex, two ventral sides flat, rooflike, apex truncate, base narrowed, hilum distinct, 4.2-4.8 x 1.6-1.8 mm. Surface fine foveolate, slight lustrous, dark-brown to black.** Native to the Caucasian region; in the Carpathians rarely cultivated as oleiferous, medicinal and ornamental plant in the past, uniquely naturalized. Mo, Ro, Uk.

**2895. *Phlomis herba-venti* L. subsp. *herba-venti*** – Perennial, stems erect, 30-60 cm high, ramified, greenish, stellate-hirsute. **Nutlets trigonnal, pyramidal, dorsal side slight convex, two ventral sides flat, rooflike, apex truncate, 4-5 x 2.2-2.6 mm. Surface glabrous, rarely slight hairy, dull, black.** Native to the Mediterranean and western Siberia, stony and steppe slopes, weed in fields on alluvial soils. Ro, Uk.

**2896. *Phlomis pungens* Willd., *Ph. herba-venti* subsp. *pungens* (Willd.) Maire ex De Phillips** – Perennial, stems greenish, stellate-tomentose, rarely glabrous, 30-80 cm high, ramified. **Nutlets elliptic, transversal section oval or roundish, 5.6-6.2 x 2.2-2.6 mm. Surface transversally fine wrinkly, lustreless, brown to dark-brown.** Native to south-eastern Europe, on steppe slopes, stony places and dry lawns, mostly in upland areas. Mo, Ro, Uk.

**2897. *Phlomis tuberosa* L.** – Perennial, stems erect, rough, 50-120 cm high, bluntly angular, simple or little ramified above. **Nutlets prolonged trigonnal, dorsal side longitudinally convex, two ventral sides**

**flat, rooflike, apex truncate and hairy, 4.7-5.3 x 1.8-2.1 mm. Surface pubescent, slight striate, dull, dark-brown.  $2n = 22$ .** Native to Eurasia, sunny steppe slopes, forest steppes with basic to neutral soils. Hu, Mo, Pl, Ro, Sk, Uk.

**2898. *Dalanum angustifolium* (Ehrh.) Dostál, *Galeopsis ladanum* L. subsp. *angustifolia* Ehrh.** – Annual, stems erect, 10-40 cm high, much ramified, with or without glandular hairs, appressed downy. **Nutlets obovate, trigonnal, 2/3 of ventral side bottom rooflike with sharp rib, base narrowed, 2.3-2.7 x 1.4-1.6 mm. Surface smooth, dull, greyish-brown with whitish spots.  $2n = 16$ .** Native to central and southern Europe, fallows, shrubby slopes, fields and screes. Hu, Pl, Ro, Sk.

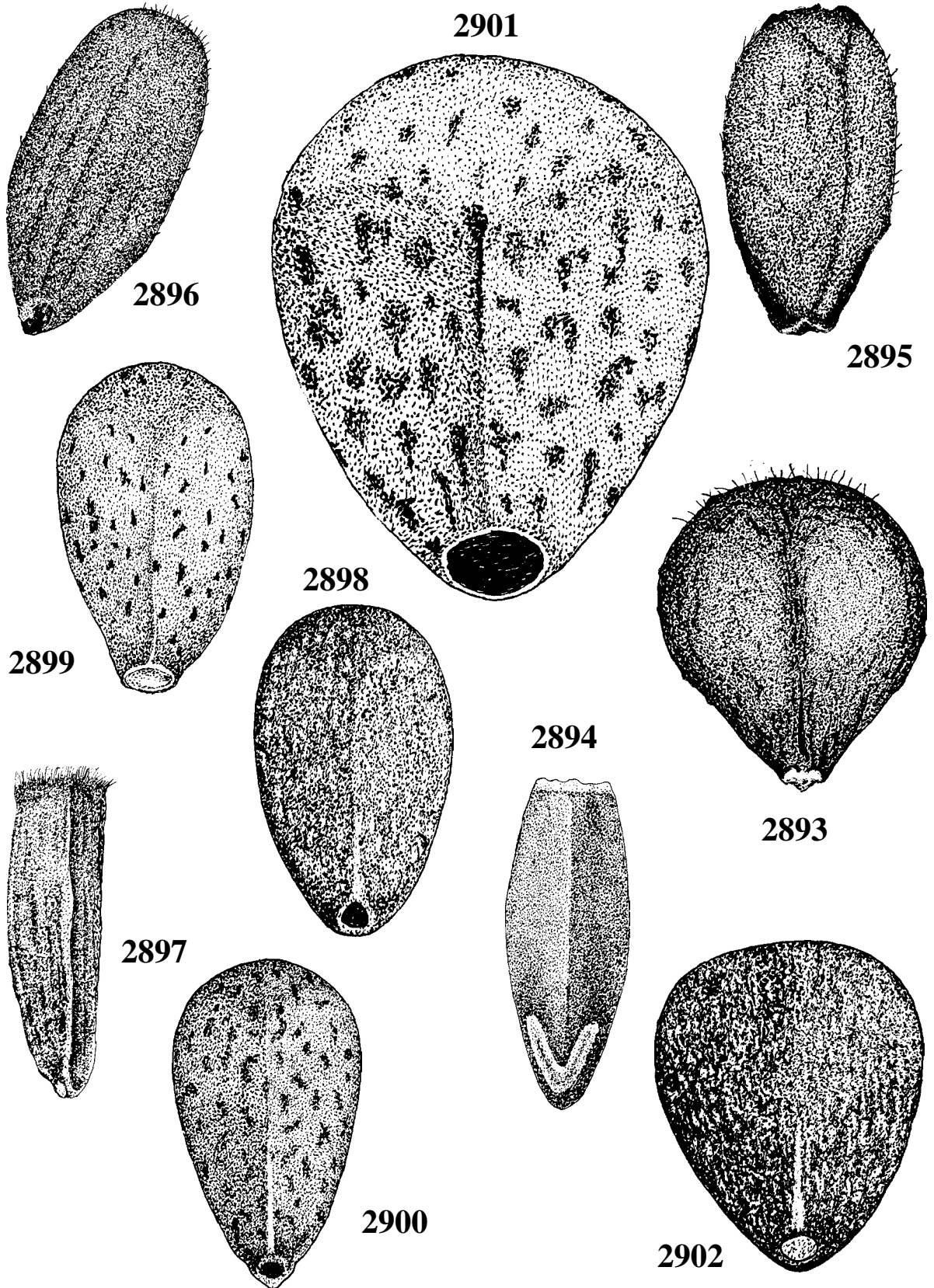
**2899. *Dalanum ladanum* (L.) Dostál, *Galeopsis ladanum* L., *G. parviflora* Lam.** – Annual, stems erect, 10-50 cm high, with crispate and patent glandular hairs. **Nutlets obovate, dorsal side convex, ventral side bottom rooflike, apex rounded, base narrowed, 2.3-2.7 x 1.4-1.7 mm. Surface dull, smooth, pale-brown with irregular dark-brown spots.  $2n = 16$ .** Native to Eurasia, sand fields, gravelly river terraces, shrubby slopes, embankments, somewhat calcifuge; in all Carpathian regions.

**2900. *Dalanum segetum* (Necker) Dostál, *Galeopsis segetum* Necker** – Annual, stems erect, 10-40 cm high, ramified, 4-angular, glandular-hirsute. **Nutlets obovate, dorsal side convex, ventral rooflike, apex broadly rounded, base narrowed, 2.6-3 x 1.5-1.7 mm. Surface smooth, dull, pale-brown, with dark-brown spots.  $2n = 16$ .** Native to western Europe; hauling into the Carpathians on fields, fallows, waste places and cut-over areas. Hu, Ro.

**2901. *Galeopsis bifida* Boenn.** – Annual, stems erect, 10-70 cm high, bristly hirsute, rough under knots. **Nutlets broadly trigonnal to obovate, dorsal side convex, ventral rooflike with indistinct rib in bottom part, 2.8-3.3 x 2.3-2.6 mm. Surface smooth, dull, pale-brown with dark-brown and black spots.  $2n = 32$ .** Native to Eurasia, fields, cut-over areas, shrubberies, waste places; in all Carpathian regions.

**2902. *Galeopsis pubescens* Besser, *G. versicolor* Spenn.** – Perennial, stems erect, 20-50 cm high, whitish and bristly hirsute, rough under knots. **Nutlets broadly obovate, ventral side bottom part rooflike, with short rib, apex truncate, base narrowed, 2.3-2.7 x 1.8-2.2 mm. Surface smooth, dull, brown**





with irregular dark-brown spots.  $2n = 16$ . Native to Eurasia, waste places, cut-over areas, forest edges, boundaries; throughout the Carpathians.

**2903. *Galeopsis speciosa*** Mill., *G. versicolor* Curt., *G. grandiflora* Domin et Podp. — Annual, stems up to 1 m high, erect, ramified, 4-angular, the angles setose, glandular, downy. **Nutlets broadly obovate, dorsal side convex, ventral side rooflike below with distinct ribs, 2.5-3 x 2.1-2.5 mm. Surface waved, pale-brown, with irregular dark-brown spots.  $2n = 16$ .** Native to Eurasia, light lowland forests, coastal shrubberies; in all Carpathian territories.

**2904. *Galeopsis tetrahit*** L. — Annual, stems erect, 10-60 cm high, bristly hirsute, simple or little ramified, rough under knots. **Nutlets broadly obovate, trigonous, dorsal side convex, ventral side bottom rooflike with short, indistinct rib, 2.7-3.3 x 2-2.4 mm. Surface smooth, irregular tuberculate, greyish-brown with dark-brown spots.  $2n = 32$ .** Native to Europe, rare in the southeast, fields, forest margins, clearing, shrubby slopes, riverbanks, overgrown waste places; throughout the Carpathians.

**2905. *Lamium album*** L. — Perennial, pubescent, stems ascendent or erect, 20-60 cm high, simple. **Nutlets prolonged trigonous, obovate, dorsal side convex, ventral rooflike with rib, apex truncate, base membranous, 2.5-3 x 1.2-1.4 mm. Surface verrucose, dull brown, warts whitish.  $2n = 18$ .** Native to Eurasia, forest margins, sides, waste places, boundaries, ditches; in all Carpathian territories.

**2906. *Lamium amplexicaule*** L., *Lamiopsis amplexicaulis* (L.) Opiz — Annual, densely appressed-pubescent, stems erect or ascendent, branched at base, 10-40 cm high. **Nutlets prolonged obovate, dorsal side slight convex, two ventral sides flat, rooflike with distinct rib, 2-2.2 x 0.9-1.1 mm. Surface covered with irregular formed whitish excrescences, dull, greyish-brown.  $2n = 18$ .** Native to Eurasia, fields, fallows, vineyards, gardens, waste places, boundaries; in all Carpathian regions.

**2907. *Lamium bifidum*** Cyr., *L. serbicum* Panč. — Annual, glabrous or pubescent, stems 10-40 cm high. **Nutlets obovate, triangular, dorsal side convex, ventral rooflike, both sides flat, apex  $\pm$  truncate, 2.5-3 x 1.3-1.5 mm. Surface densely whitish verrucose, faint lustrous, grey.** Native to southern European open habitats. Ro.

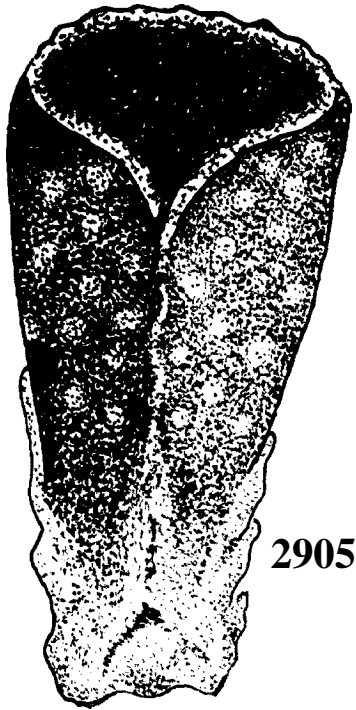
**2908. *Lamium garganicum*** L., *L. bithynicum* Benth. — Perennial, stems up to 50 cm high, densely hairy, leaves cordate-ovate to reniform, up to 70 x 40 mm. **Nutlets obovate, dorsal side convex, both ventral sides flat, rooflike, apex truncate, bottom narrowed, 2.5-3 x 1.5-1.7 mm. Surface whitish, verrucose, lustreless, grey.  $2n = 18$ .** Native to southern Europe, mountain calcareous rocks, stony and scree slopes. Ro.

**2909. *Lamium hybridum*** Vill., *L. incisum* Willd., *L. dissectum* With. — Annual up to biennial, stem procumbent to erect, 8-10 cm high, ramified from base, downy. **Nutlets obovate, dorsal side slight convex, two ventral sides flat and rooflike, base narrowed, membranous, 2.1-2.4 x 1.1-1.3 mm. Surface whitish, verrucose, dull, grey.  $2n = 36$ .** Hybrid *L. bifidum* x *purpureum*, cultivated as an ornamental in gardens; in the Carpathian regions rare. Pl, Ro.

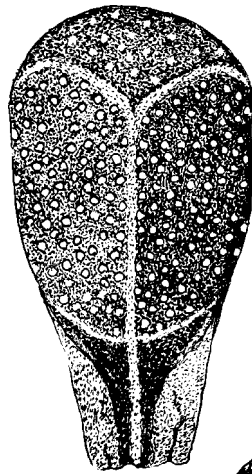
**2910. *Lamium maculatum*** L., *L. foliosum* Crantz — Perennial, stems ascendent to erect, 15-70 cm high, prevailing simple, downy above. **Nutlets obovate,  $\pm$  dorsal side slight convex, two ventral sides flat, rooflike, with rib, truncate above, narrowed below, 2.9-3.5 x 1.6-1.8 mm. Surface verrucose, dull, brown.  $2n = 18$ .** Native to Europe, woodland margins, shrubberies, riverbanks, tickets, damp soils, gardens; throughout the Carpathians.

**2911. *Lamium molucellifolium*** Fries, *L. intermedium* Fries — Annual, up to 40 cm high, downy, leaves ovoid-roundish, notched or serrate. **Nutlets obtriangular, dorsal side convex, ventral rooflike, apex truncate, bottom narrowed, ended with orange caruncula, 2-2.8 x 1.1-1.3 mm. Surface tuberculate, slight lustrous, greyish.  $2n = 36$ .** Native to Europe, rarely on dryer steppes, the species is of hybrid origin (*Lamium amplexicaule* x *purpureum*).

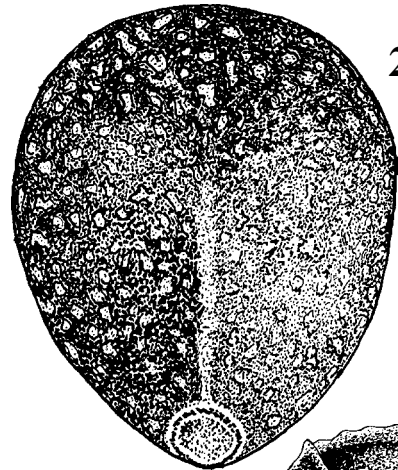
**2912. *Lamium orvala*** L. — Perennial, bare or dispersed hirsute, stem ascending, branched at base, 10-100 cm high, leaves long stalked (5-10 cm), triangular-ovate, irregular dentate, flowers pink to violet. **Nutlets obovate, lateral slight compressed with a distinct, roundish or oval hilum, 2.8-3.2 x 1.9-2.2 mm. Surface fine granulate, lustreless, brown.  $2n = 18$ .** Native to the East Alps; in the Carpathians rarely cultivated in gardens as an ornamental. Hu, Mo, Ro, Sk.



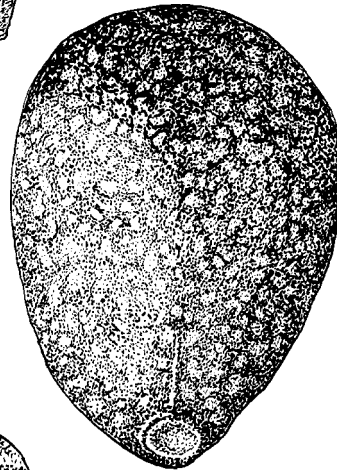
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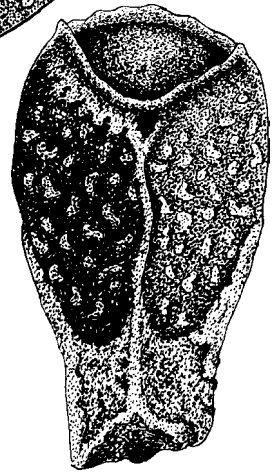
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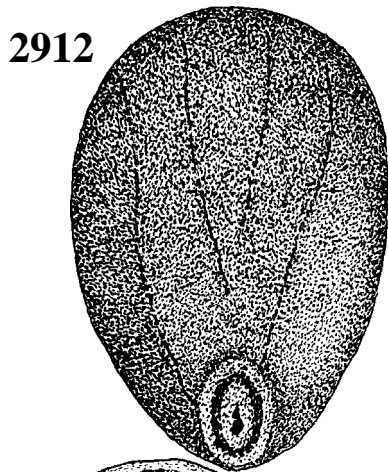
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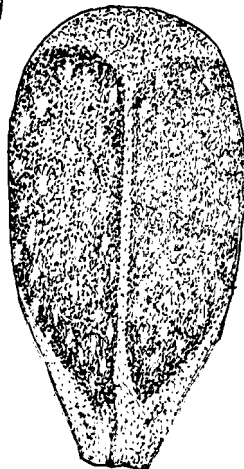
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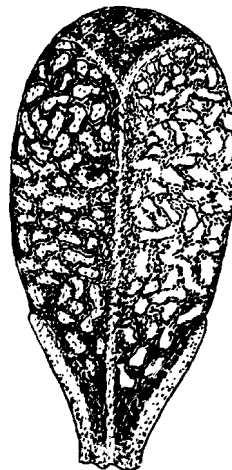
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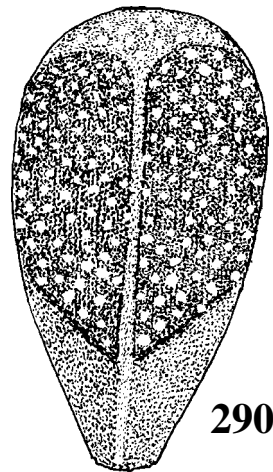
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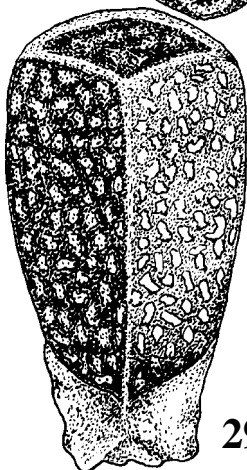
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**2913. *Lamium purpureum* L.** — Annual (biennial), stems erect or shortly ascendent, downy, ramified at base, 10-45 cm high. **Nutlets elliptic or obovate, dorsal side convex, two ventral sides flat and rooflike with rib, apex truncate, 2-2.4 x 1.2-1.4 mm. Surface verrucose, dull, greyish-brown. 2n = 18.** Native to most of Europe, fields, weedy places, along waysides, shrubby slopes, forests, gardens; in all Carpathian regions.

**2914. *Galeobdolon luteum* Huds., *Lamium galeobdolon* (L.) L.** — Perennial, stems ascendent or erect, 15-40 cm high, sparsely to densely hairy on edges. **Nutlets obovate, two ventral sides flat, rooflike, apex truncate, base with yellowish-orange, membranous caruncula, 2.8-3.4 x 1.6-1.8 mm. Surface fine sulcate, lustrous, black. 2n = 18.** Native to the most of Europe, woods and shady places, shrubberies, meadows, from lowland to mountain zones; in all Carpathian regions.

**2915. *Leonurus cardiaca* L., *Cardiaca vulgaris* Moench** — Perennial, stems erect, villous, 30-200 cm high, much ramified. **Nutlets obovate-angular, dorsal side slight convex, two ventral sides flat and rooflike, apex truncate with hairs, 2-2.4 x 1.2-1.4 mm. Surface slight wrinkly, dull, brown. 2n = 18.** Native to Eurasia, dry meadows and pastures, boundaries, waste places; cultivated in all Carpathian regions as a honey-bearing plant.

**2916. *Leonurus glaucescens* Bunge** — Perennial, stems 30-100 cm high, angular, pubescent at angles. **Nutlets oblong-obovate, dorsal side convex, ventral rooflike, apex truncate, hairy, bottom gradually narrowed, 2.2-2.4 x 1.3-1.4 mm. Surface covered with oblong tubercles, dull, pale-brown.** Native to southeastern Europe, ruderal places and stony slopes. Mo, Uk.

**2917. *Leonurus quinquelobatus* Gilib., *L. villosus* Desf. ex D'Urv.** — Perennial, stem robust, up to 50-100 cm high, with long-patent hairs. **Nutlets oblong-obovate, dorsal side convex, ventral rooflike, apex truncate, bottom gradually narrowed, with large hilum, 2.3-2.5 x 1.3-1.4 mm. Surface pubescent at apex, the rest fine colliculate and narrowly ribbed on edges, dull, pale-brown.** Native to Euro-Siberia, ruderal, sunny, nutrient-rich places. Mo, Ro, Sk, Uk.

**2918. *Chaiturus marrubiastrum* (L.) Ehrh. ex Spenn., *Ch. leonuroides* Willd., *Leonurus marru-***

***biastrum* L.** — Biennial, stems erect or ascendent, 40-120 cm high, simple or ramified at base, pubescent. **Nutlets obovate, two ventral sides flat, rooflike with indistinct rib, apex truncate and hairy, 1.6-1.9 x 1-1.2 mm. Surface favulariate, dull, glabrous, dark-brown. 2n = 24 (28).** Native to Eurasia, pastures, shrubberies, waste grounds, forest margins; in all Carpathian territories.

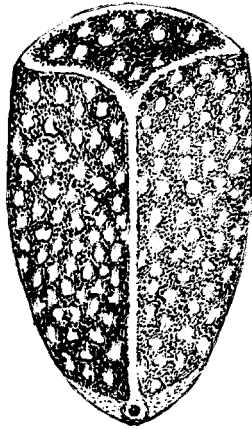
**2919. *Ballota foetida* Lam., *B. nigra* subsp. *foetida* Hayek** — Perennial, up to 100 cm high, stems pubescent to subglabrous with papillae and non-shining glands. **Nutlets obovate, dorsal side convex, two ventral sides flat, rooflike with indistinct rib, apex rounded, 1.9-2.2 x 1-1.2 mm. Surface foveolate, glossy, brown to black. 2n = 20.** Native to southern Europe, naturalized in central and northern Europe. Pl, Ro, Sk, Uk.

**2920. *Ballota nigra* L. subsp. *nigra*, *B. ruderalis* Sw.** — Perennial, stems erect or ascendent, 30-120 cm high, pubescent to subglabrous. **Nutlets elliptic, dorsal side convex, two ventral sides flat, rooflike with indistinct rib, 1.9-2.3 x 1-1.2 mm. Surface glabrous, lustrous, fine foveolate, dark-brown to black. 2n = 20, 22.** Native to Eurasia, waste, grounds, boundaries, roadsides, walls, riverbanks, rather moist soils; in all Carpathian regions.

**2921. *Stachys alpina* L., *Eriostomum alpinum* (L.) Hoffm. ex Link** — Perennial, hirsute, glandular, stems ascendent or erect, 30-100 cm high, simple or branched. **Nutlets broadly obovate, dorsal side convex, two ventral sides rooflike with rib, apex rounded, 2.2-2.7 x 1.8-2.2 mm. Surface fine wrinkly, whitish-spotted, dull, dark-brown. 2n = 30.** Native to Europe, wet lowland woods, mountain meadows, overgrown screes, forest margins. Hu, Pl, Ro, Sk, Uk.

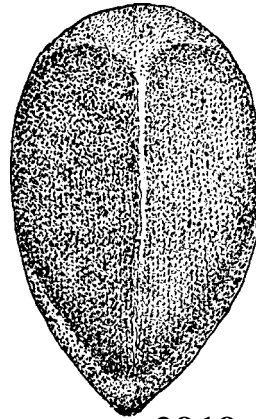
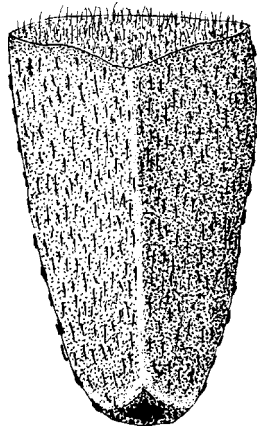
**2922. *Stachys annua* (L.) L., *Betonica annua* L., *Stachys micrantha* K. Koch** — Annual, pubescent, sometimes glandular, stems erect, ramified, 10-40 cm high. **Nutlets broadly obovate to globose, two ventral sides flat, rooflike with indistinct rib, apex rounded, 1.6-2 x 1.4-1.6 mm. Surface granulate, dull, greyish-brown. 2n = 34.** Native to Eurasia, cultivated fields and other open habitats, somewhat calcicole; in all Carpathian regions.

**2923. *Stachys arvensis* L., *Glechoma arvensis* L.** — Annual, stems procumbent to erect, 10-40 cm high, branched from the base. **Nutlets spherical or**

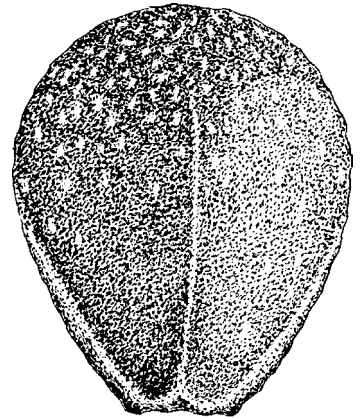


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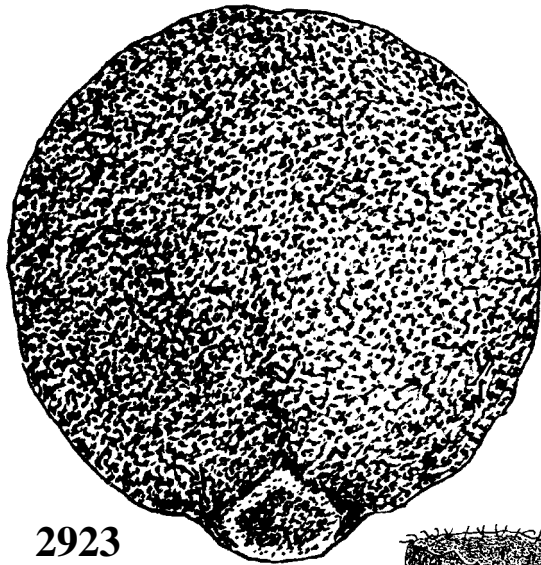
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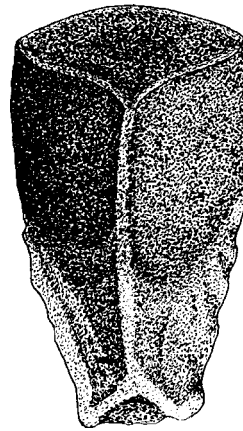
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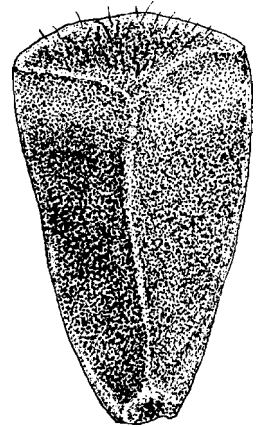
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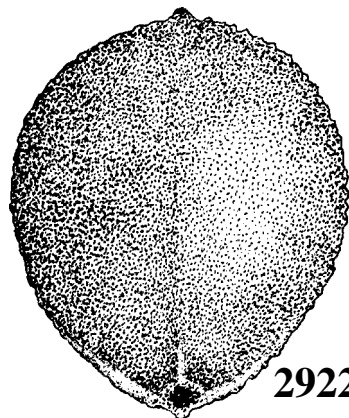
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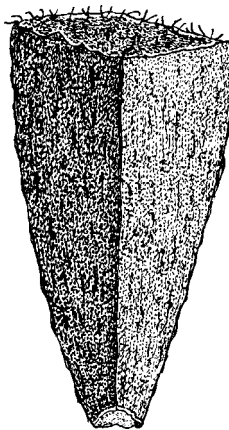
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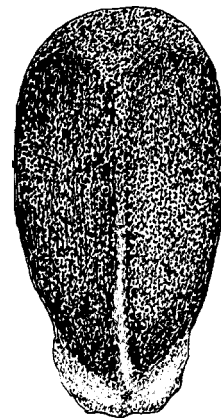
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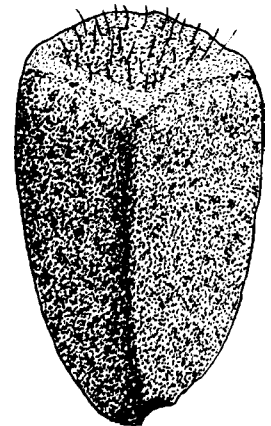
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obovate, dorsal side convex, two ventral sides  $\pm$  flat, rooflike with indistinct rib, apex obtuse, 1.5-1.7 x 1.4-1.6 mm. Surface granulate, dull, greyish-black.  $2n = 10$ . Native to Europe, cultivated fields, gardens, vineyards and sandy grounds, usually a calcifuge; in all Carpathian regions.

**2924. *Stachys byzantina*** C. Koch, *S. olympica* Poir., *S. lanata* Jacq. — Perennial, stem 20-80 cm high, densely tomentose. **Nutlets broadly obovate, dorsal side convex, two ventral sides rooflike with short ribs, apex rounded, 2-2.3 x 1.5-1.7 mm. Surface fine reticulate-foveate, glabrous, dull, greyish-brown.  $2n = 30$ .** Originally growing in southeastern Europe and western Asia, often cultivated as an ornamental in gardens, uniquely naturalized.

**2925. *Stachys germanica*** L., *S. argentea* Tausch — Biennial to perennial, stems ascendent to erect, 30-120 cm high, simple or little ramified. **Nutlets broadly obovate, bluntly trigonous, dorsal side convex, two ventral sides rooflike, apex rounded, 1.9-2.2 x 1.4-1.6 mm. Surface wrinkly-granulate, greyish-brown, whitish-spotted.  $2n = 30$ .** Native to Europe, light forests and shrubby sunny slopes, overgrown rocks, cut-over areas; throughout the Carpathians.

**2926. *Stachys grandiflora*** Benth., *Betonica grandiflora* Willd. — Perennial, stems 20-50 cm high, erect or slight crooked, hirsute. **Nutlets prolonged obovate, dorsal side convex, two ventral side flat, rooflike, apex truncate, 4.2-4.6 x 2.3-2.6 mm. Surface wrinkly, dull, brown.** Native to southeastern Europe and southwestern Asia, subalpine meadows; in the Carpathians sometimes planted near dry walls and in garden-beds.

**2927. *Stachys maritima*** Gouan — Perennial, stems 15-30 cm high, much ramified from the base, ascendent or erect, tomentose. **Nutlets broadly globose or blunt angular, dorsal side convex, two ventral sides  $\pm$  flat, rooflike with indistinct rib, apex truncate, 1.8-2.2 x 1.5-1.8 mm. Surface granulate, lustreless, grey or brown.** Native to the Mediterranean and Black Sea, on maritime littoral sands. Ro.

**2928. *Stachys obliqua*** Waldst. et Kit. — Perennial, stems erect, 20-50 cm high, lanate-hirsute, leaves oblong-lanceolate, 40-60 x 15-25 cm long, rounded or slight cordate at base. **Nutlets elliptic or obovate, 2 lateral sides flat, dorsal side convex, ventral rooflike, 2.5-2.9 x 1.9-2.1 mm. Surface faint undu-**

**late or smooth, dull, lustreless, greyish-brown.** Native to the Balkan Peninsula. Ro.

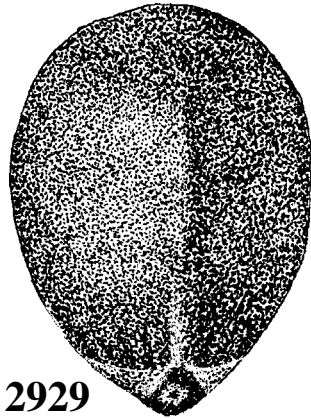
**2929. *Stachys palustris*** L., *S. maeotica* Postr. — Perennial, stems erect, 30-120 cm high, hirsute, sometimes glandular above. **Nutlets obovate, two ventral sides flat, rooflike with rib, apex rounded, 2-2.2 x 1.4-1.6 mm. Surface faint granulate, lustrous, glabrous, greyish-brown.  $2n = 64$ .** Native to most of Europe, damp places, cultivated fields, coastal meadows and shrubberies, pastures and boundaries. Hu, Mo, Pl, Ro, Sk, Uk.

**2930. *Stachys recta*** L. — Perennial, stems erect or ascendent, 15-100 cm high, dispersed hirsute or glabrous, simple or branched. **Nutlets elliptic to obovate, dorsal side convex, two ventral sides  $\pm$  flat, rooflike with rib, apex truncate-rounded, 2-2.4 x 1.5-1.7 mm. Surface fine granulate, dull, glabrous, dark-brown.  $2n = 34$ .** Native to Europe, dry places, sunny stony slopes, forest margins and steppes, boundaries, thickets; in all Carpathian regions.

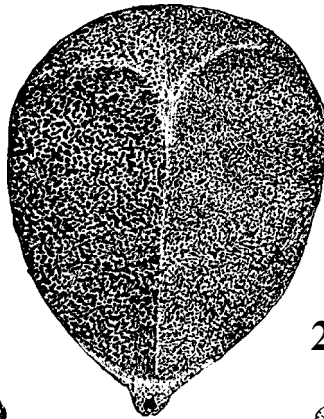
**2931. *Stachys sylvatica*** L., *S. canescens* Muss. Puschk. ex Spreng. — Perennial, densely hirsute, glandular above, stems erect, 40-100 cm high. **Nutlets broadly obovate, dorsal side convex, two ventral sides rooflike with longitudinal rib, apex rounded, 1.8-2.3 x 1.4-1.6 mm. Surface granulate, dull violet-brown to black.  $2n = 64, 66$ .** Native to Eurasia, deciduous, mixed and lowland wet forests, shrubberies, mountain meadows with higher groundwater; in all Carpathian regions.

**2932. *Betonica hirsuta*** L., *Stachys hirsuta* Humb. Bonpl. et Kunth. — Perennial, stems 10-35 cm high, erect rarely ascendent, simple, hirsute. **Nutlets obovate or elliptic, two ventral sides  $\pm$  flat, rooflike with distinct pale rib, mostly all-round or partly winged, 3.2-3.6 x 2-2.2 mm. Surface wrinkly, dull, black.** Native to southern and eastern Europe, stony mountain sites. Ro.

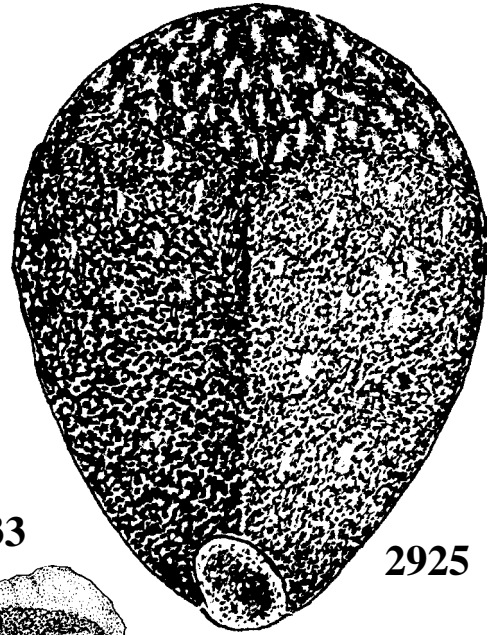
**2933. *Betonica officinalis*** L., *Stachys officinalis* (L.) Trevis, *S. betonica* Benth. — Perennial, stems erect, 20-100 cm high, hirsute to glabrous, unbranched. **Nutlets prolonged elliptic, dorsal side slight convex, two ventral sides flat, rooflike, rib straight, apex truncate-winged, 2.7-3.1 x 1.3-1.5 mm. Surface dull, faint wrinkly, dark-brown.  $2n = 16$ .** Native to Eurasia, meadows, pastures, deciduous forests and shrubberies; in the whole Carpathians.



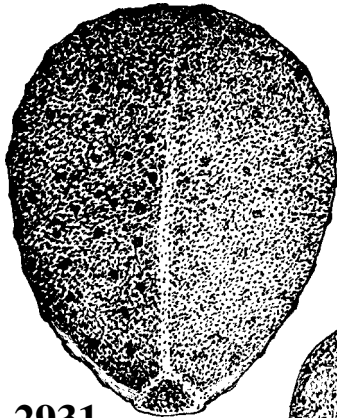
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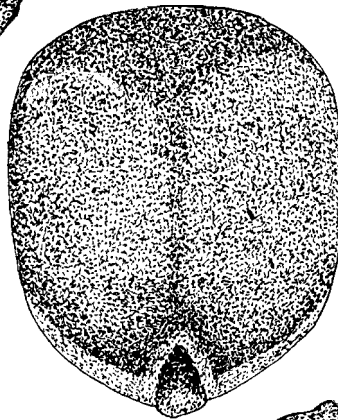
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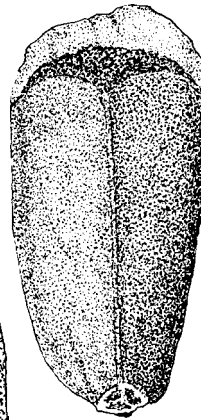
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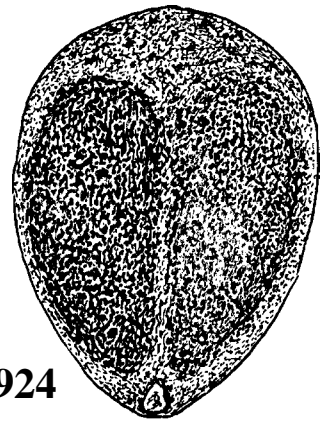
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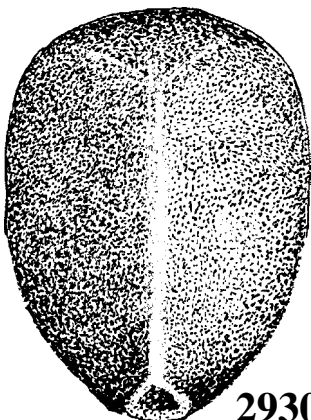
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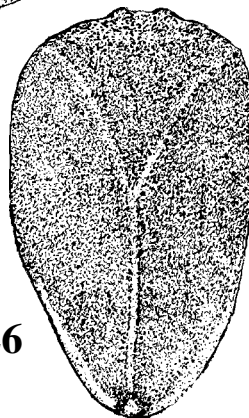
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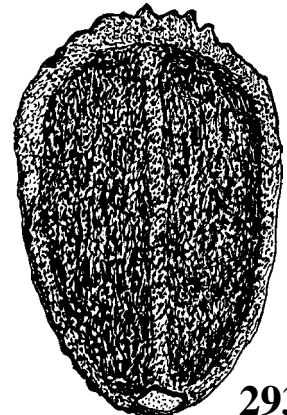
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**2934. *Nepeta cataria* L., *Cataria vulgaris* Moench** — Perennial, turfing, tomentose, stems erect, 4-100 cm high, ramified. **Nutlets ovate to elliptic, slight flattish, ventral side ribs indistinct, apex and base bluntly rounded, 1.3-1.6 x 1.1-1.3 mm. Surface slightly lustrous, fine granulate, violet-brown.  $2n = 34$  (32, 36).** Native to Eurasia, meadows, waste places, shrubberies, boundaries and roadsides; throughout the Carpathians.

**2935. *Nepeta grandiflora* M. Bieb.** — Perennial, glabrous, stems erect, 40-80 cm high, branched. **Nutlets broadly elliptic, dorsal side convex, ventral side rooflike, apex rounded, base with prolonged whitish hilum, 1.7-2.1 x 1.1-1.3 mm. Surface reticulate-foveate dull, dark-brown.  $2n = 36$ .** Originally growing in the Caucasus; in the Carpathians cultivated as an ornamental in gardens, uniquely naturalized.

**2936. *Nepeta pannonica* L., *N. nuda* L.** — Perennial, bare or downy above, stems erect, 50-120 cm high, ramified. **Nutlets ovate to elliptic, dorsal side convex, ventral side rooflike, rib indistinct, apex with excrescences, two whitish hilums at the bottom, 1.7-2.1 x 1.1-1.3 mm. Surface reticulate-foveate, dull, dark-brown to black.  $2n = 18$ .** Native to Eurasia, stony and shrubby slopes, forest steppes. Hu, Mo, Ro, Sk, Uk.

**2937. *Nepeta parviflora* M. Bieb., *N. euxina* Velen.** — Perennial, stems erect or ascendent, 20-70 cm high, ramified above. **Nutlets ovate to elliptic, apex rounded with short excrescences, 1.5-1.7 x 1-1.2 mm. Surface reticulate-foveate, dull, dark-brown to blackish.** Native to southern Europe, steppes, grassy calcareous slopes, rare in fields. Hu, Mo, Ro, Uk.

**2938. *Nepeta racemosa* Lam., *N. mussinii* Spreng.** ex Henckel, *N. longifolia* Sims. — Perennial, tomentose, stems procumbent, branched, 20-30 cm high. **Nutlets broadly elliptic, slight flattish, ventral side rooflike, apex and base rounded, base with prolonged whitish hilum, 1.7-1.9 x 1.2-1.3 mm. Surface reticulate-foveate, dull, dark-brown to black.  $2n = 18$ .** Native to the Caucasus and the Caspian region, dry gravelly and stony slopes; in the Carpathians cultivated in gardens, rock-gardens and parks. Hu, Sk.

**2939. *Nepeta ucrainica* L., *Teucrium sibiricum* L.** l. c. — Perennial, stems 17-50 cm high, erect, ramified, glabrous. **Nutlets elliptic, ventral side rooflike,**

**apex with short excrescences, 1.9-2.2 x 1-1.2 mm. Surface verruculose, dull, dark-brown to black, hilum white.** Originally growing in southeastern Europe, lowland, mountain steppes and meadows, gravelly and stony slopes. Ro.

**2940. *Glechoma hederacea* L.** — Perennial, downy to subglabrous, flowering stems ascendent up to erect, 10-40 cm high, non-flowering creeping. **Nutlets elliptic with narrow margin around, apex rounded, hilum impressed at base, 1.7-2 x 0.8-1 mm. Surface dull, smooth, pale- to reddish-brown, hilum white.  $2n = 18, 26$ .** Native to Euro-Siberia, moist to wet forests, shrubberies, meadows, boundaries and thickets; in all Carpathian regions.

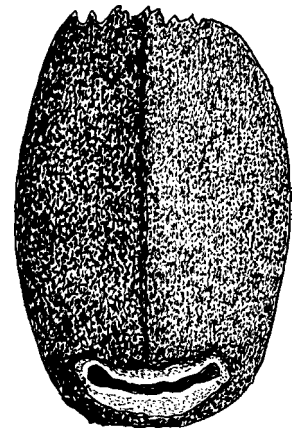
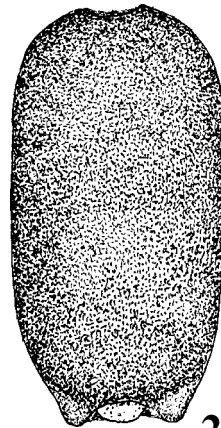
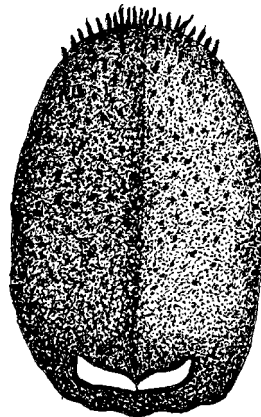
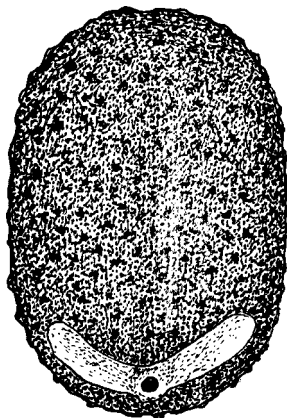
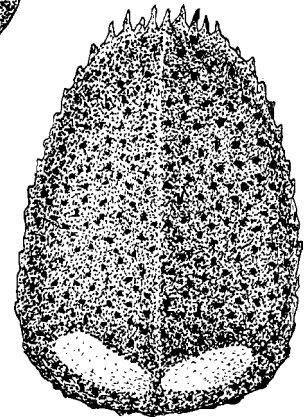
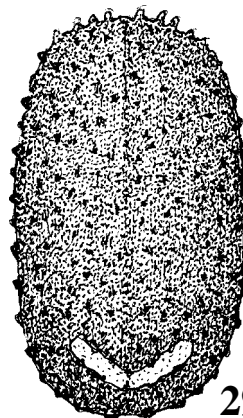
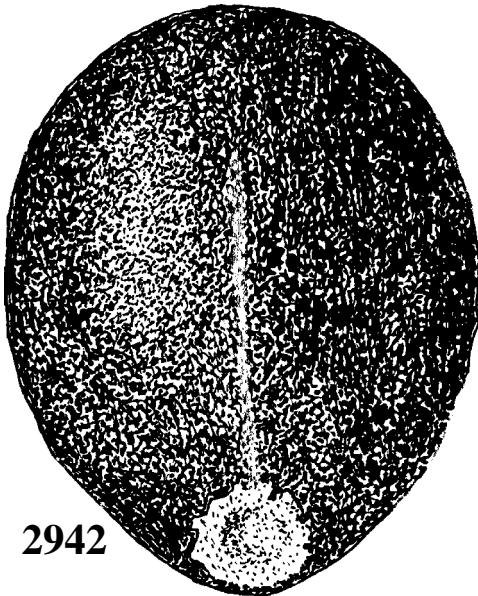
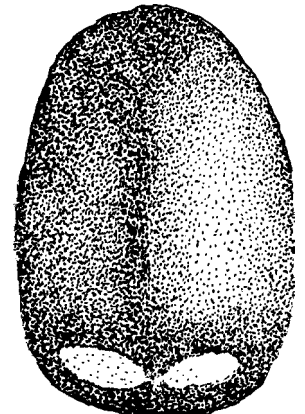
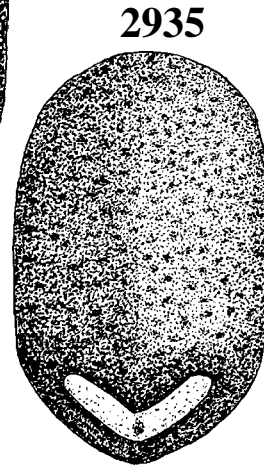
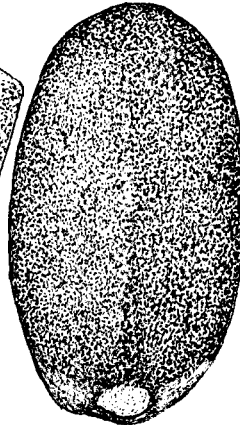
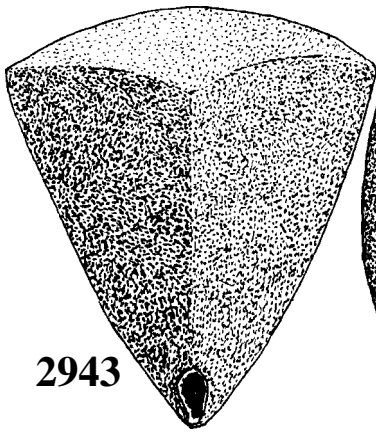
**2941. *Glechoma hirsuta* Waldst. et Kit.** — Perennial, densely hirsute, stems up to 60 cm high. **Nutlets elliptic with narrow margin around, apex rounded, hilum impressed at base, 1.8-2.1 x 0.9-1.1 mm. Surface dull, smooth, pale- to dark-brown, hilum whitish.  $2n = 36$ .** Native to Europe, in deciduous, moist forests and shrubberies, throughout the Carpathians.

**2942. *Plectranthus fruticosus* (L.)'Hérit** — Shrub, stems up to 1 m high, flower corolla pale-alabaster. **Nutlets obovate, dorsal side convex, ventral slight rooflike or convex, with indistinct rib, 1.5-1.7 x 1.2-1.4 mm. Surface smooth, lustrous, blackish-brown to black.** Native to southern Africa; in the Carpathians rarely cultivated for ornament in flower-pots.

**2943. *Molucella laevis* L.** — Annual, stems 30-100 cm high, erect, usually unramified. **Nutlets obovate, dorsal side slight convex, two ventral sides flat, rooflike, apex truncate, base narrowed with rounded hilum, 3.2-3.6 x 2.8-3.2 mm. Surface verruculose, glabrous, pale-brown.** Native to the Mediterranean; in the Carpathians cultivated as an ornamental plant, uniquely naturalized in waste places.

**2944. *Dracocephalum austriacum* L., *Ruyschiana laciniata* Mill.** — Perennial, semishrub, stems ascendent or erect, simple or little ramified, 15-50 cm high. **Nutlets elliptic, ventral side slight rooflike, apex truncate, waved, tooth-leaved, base truncate with horizontal broad hilum, 3.3-3.7 x 1.9-2.1 mm. Surface smooth, lustrous, glabrous, black.  $2n = 14$ .** Native to Eurasia, sunny calcareous grounds rich in nutrients. Hu, Mo, Pl, Ro, Sk, Uk.





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**2945. *Dracocephalum grandiflorum* L., *D. altaense* Laxm.** — Perennial, stems erect or ascending, shortly pubescent, densely above, 10-30 cm high. **Nutlets oblong-ovate, dorsal side convex, ventral rooflike, flat with longitudinal rib, apex truncate, bottom with large reniform hilum, 3.4-3.8 x 1.3-1.5 mm. Surface hoarfrosted, dull, greyish.** Native to Asia, alpine meadows, rocky and stony slopes; in the Carpathians rarely cultivated as ornamental in gardens.

**2946. *Dracocephalum moldavica* L., *Moldavica suaveolens* Gilib.** — Annual, glabrous or sparsely hairy, aromatic, stems erect, branched, 30-60 cm high. **Nutlets obovate, dorsal side convex, ventral side rooflike, apex truncate, narrowed base with impressed whitish hilum, 2.6-3 x 1.5-1.8 mm. Surface waved, dull, glabrous, blackish-brown. 2n = 10.** Originally growing in Asia, stony and rocky places on calcareous grounds, in the subalpine zone, naturalized as a weed and ruderal. Hu, Mo, Pl, Ro, Sk, Uk.

**2947. *Dracocephalum ruyschiana* L., *Ruyschiana spicata* Mill.** — Perennial, stems erect or ascendent, 20-60 cm high, hirsute to glabrous. **Nutlets ovate to elliptic, ventral side rooflike with indistinct rib, apex with rest of wing, base with large hilum, 2.8-3.2 x 1.6-1.8 mm. Surface smooth, slight lustrous, glabrous, black. 2n = 14.** Native to Eurasia, calcareous rocks, meadows and scrubs in subalpine stands. Br, Hu, Pl, Ro, Sk, Uk.

**2948. *Dracocephalum thymiflorum* L., *Zornia parviflora* Moench** — Annual, stems erect, sparsely pubescent, 10-60 cm high. **Nutlets elliptic, slight compressed, ventral side rooflike, apex rounded, base narrowed with white hilum, 1.6-1.8 x 0.8-0.9 mm. Surface lustrous, smooth or faint granulate, dark-brown. 2n = 14.** Native to eastern Europe and Asia; recently often hauling into the Carpathians with cereals and clover, often naturalized. Mo, Pl, Ro, Sk, Uk.

**2949. *Prunella grandiflora* (L.) Scholler** — Perennial, sparsely pubescent, stems ascending, unbranched, 10-50 cm high. **Nutlets globose-obovate, dorsal side slight convex, ventral rooflike, slight flattish, base with obtrigonus hilum, 1.7-1.9 x 1.5-1.7 mm. Surface smooth, lustrous, brown with dark-brown longitudinal stripes. 2n = 28.** Native to Eurasia, semisteppe meadows and shrubby slopes, mostly calcicole; throughout the Carpathians.

**2950. *Prunella laciniata* (L.) L., *P. alba* Pall. ex M. Bieb.** — Perennial, densely pubescent, stems ascending to erect, branched, up to 30 cm high. **Nutlets prolonged obovate, ventral side slight rooflike, base with obtrigonus hilum, 2-2.3 x 1.1-1.3 mm. Surface smooth, lustrous, brown with dark-brown longitudinal stripes. 2n = 28.** Native to Eurasia, semisteppe meadows and shrubby slopes, mostly stony, calcareous grounds; in all Carpathian regions.

**2951. *Prunella vulgaris* L.** — Perennial, ± pubescent, stems ascendent, 5-50 cm high, little branched. **Nutlets obovate, oblong, strong compressed, dorsal side convex, ventral side slight rooflike, hilum obtrigonus beak, 1.6-2 x 1-1.2 mm. Surface smooth, lustrous, light-brown with dark-brown longitudinal stripes. 2n = 28.** Native to Eurasia, common in grasslands, open woods, fields, scrubs; almost throughout the whole Carpathians.

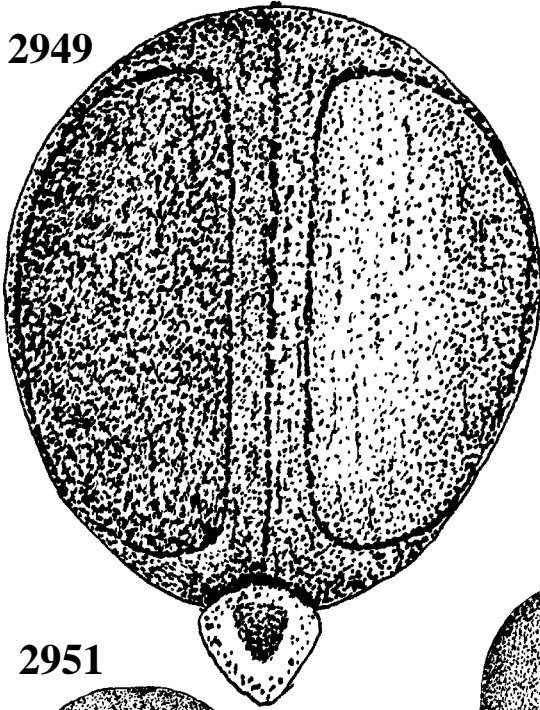
**2952. *Melissa officinalis* L., *M. graveolens* Host** — Perennial, glandular-hirsute, aromatic, stem erect, 30-150 cm high, ramified. **Nutlets prolonged obovate, dorsal side convex, ventral sides flat and rooflike with longitudinal rib, 1.7-1.9 x 0.9-1.1 mm. Surface slight lustrous, fine granulate, brown to black, hilum white. 2n = 32.** Native to the eastern Mediterranean; in the Carpathians since old times cultivated as a medical plant for its aromatic foliage, uniquely naturalized. Hu, Mo, Pl, Ro, Sk, Uk.

**2953. *Monarda didyma* L.** — Perennial, stems 50-90 cm high, angular, aromatic, hirsute to glabrous, ramified. **Nutlets elliptic, dorsal side convex, two ventral sides flat and rooflike, apex rounded, base with two large hilums, 1.5-1.8 x 0.8-1 mm. Surface smooth, slight lustrous, brown. 2n = 32.** Originally growing in North America; in the Carpathians often cultivated as an ornamental.

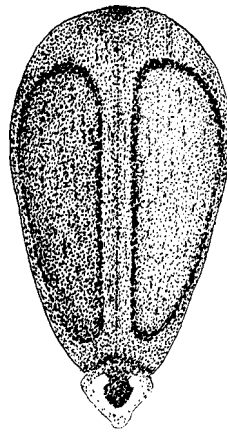
**2954. *Monarda fistulosa* L.** — Perennial, very similar to *M. didyma*. **Nutlets elliptic, ventral side rooflike, with indistinct rib, slight rounded apex, 1.5-1.8 x 0.9-1.1 mm. Surface smooth, dull to slight lustrous, brown to dark-brown.** Originally growing in North America; in the Carpathians cultivated as decorative plant in gardens and parks.

**2955. *Ziziphora capitata* L., *Z. compacta* Friv.** — Annual, etheric small plant, 6-20 cm high, simple or ramified below. **Nutlets prolonged ovate, lateral side indistinct rooflike, dorsal side convex with longitudinal indistinct rib, apex rounded, base**

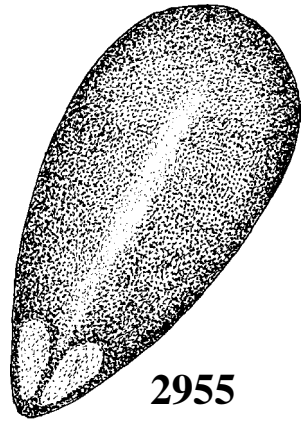
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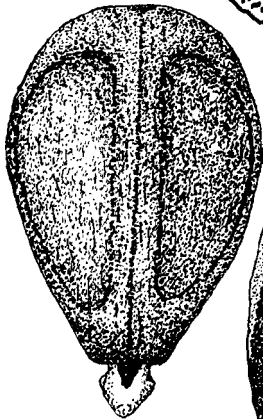
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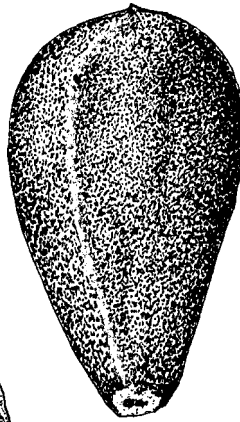
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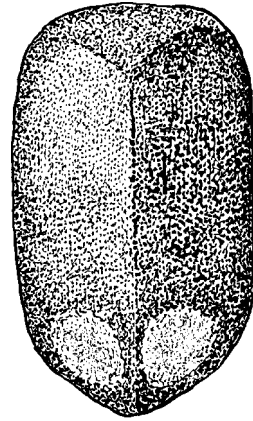
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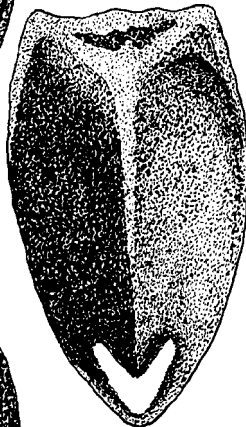
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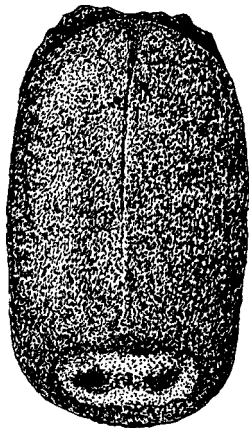
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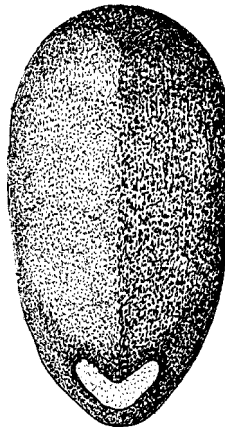
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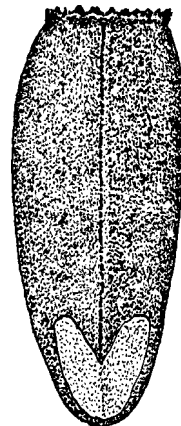
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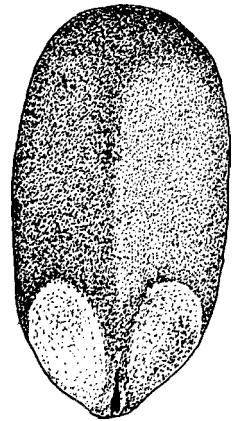
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narrowed with white hilum, 1.4-1.7 x 0.6-0.8 mm. Surface reticulate, dull or slight lustrous, dark-brown. Native to the eastern Mediterranean, steppe and stony slopes, abandoned fields. Ro, Uk.

**2956. *Satureja coerulea*** Janka — Perennial, semishrub, flowering stems 15-25 cm high, twigs ramified, puberulent, densely leafy. **Nutlets elliptic to globose, dorsal side convex, ventral side rooflike, apex rounded, base with two hilums, 1.3-1.6 x 1-1.2 mm. Surface fine granulate, dull, glabrous, dark-brown.** Endemic to Romania and Bulgaria, dry stony hills. Ro.

**2957. *Satureja hortensis*** L. — Annual, aromatic, puberulent, stems erect, 10-30 cm high, much ramified. **Nutlets oval to obovate, dorsal side convex with darker streaks, ventral side obtuse rooflike, apex and base narrowed, three-parted hilum at base, 1.3-1.6 x 0.9-1.1 mm. Surface fine granulate, slight lustrous, greyish-brown. 2n = 45, 46, 48.** Originally growing in southeastern Europe, since many years cultivated in gardens and as pot-herb spice plant. Hu, Ro, Sk, Uk.

**2958. *Satureja kitaibelii*** Wierzb. — Perennial, semishrub with ramified stems, 30-70 cm high, glabrous below, hirsute above. **Nutlets obovate to elliptic or globose, slight flattish from both sides, dorsal side often with 1 or 2 darker longitudinal streaks, ventral side indistinct rooflike, 1.5-1.8 x 1-1.2 mm. Surface granulate, dull, pale-brown. 2n = 30.** Native to the northern part of the Balkan Peninsula; in the Carpathians rarely cultivated in gardens. Ro.

**2959. *Satureja montana*** L., *Micromeria montana* Rchb. — Perennial, semishrub, 20-70 cm high, flowering stems erect, 4-angular, hirsute, broomy-ramified. **Nutlets obovoidal or elliptic to globose, dorsal side convex with darker streaks, ventral side rooflike, 1-1.3 x 0.7-0.9 mm. Surface granulate, dull or faint lustrous, brown.** Native to southern Europe; rarely planted as an ornamental in rock-gardens. Ro.

**2960. *Satureja thymifolia*** Scop., *Micromeria thymifolia* (Scop.) Fritsch — Perennial, stems 20-50 cm high, erect, mostly branched, glabrous or minutely deflexed-puberulent. **Nutlets elliptic, apex obtuse or subacute, minute whitish hairy, bottom with large hilum, 1-1.2 x 0.5-0.6 mm. Surface granulate, faint lustrous, brown.** Native to the western part of the Balkan Peninsula; rare in the Carpathians. Hu.

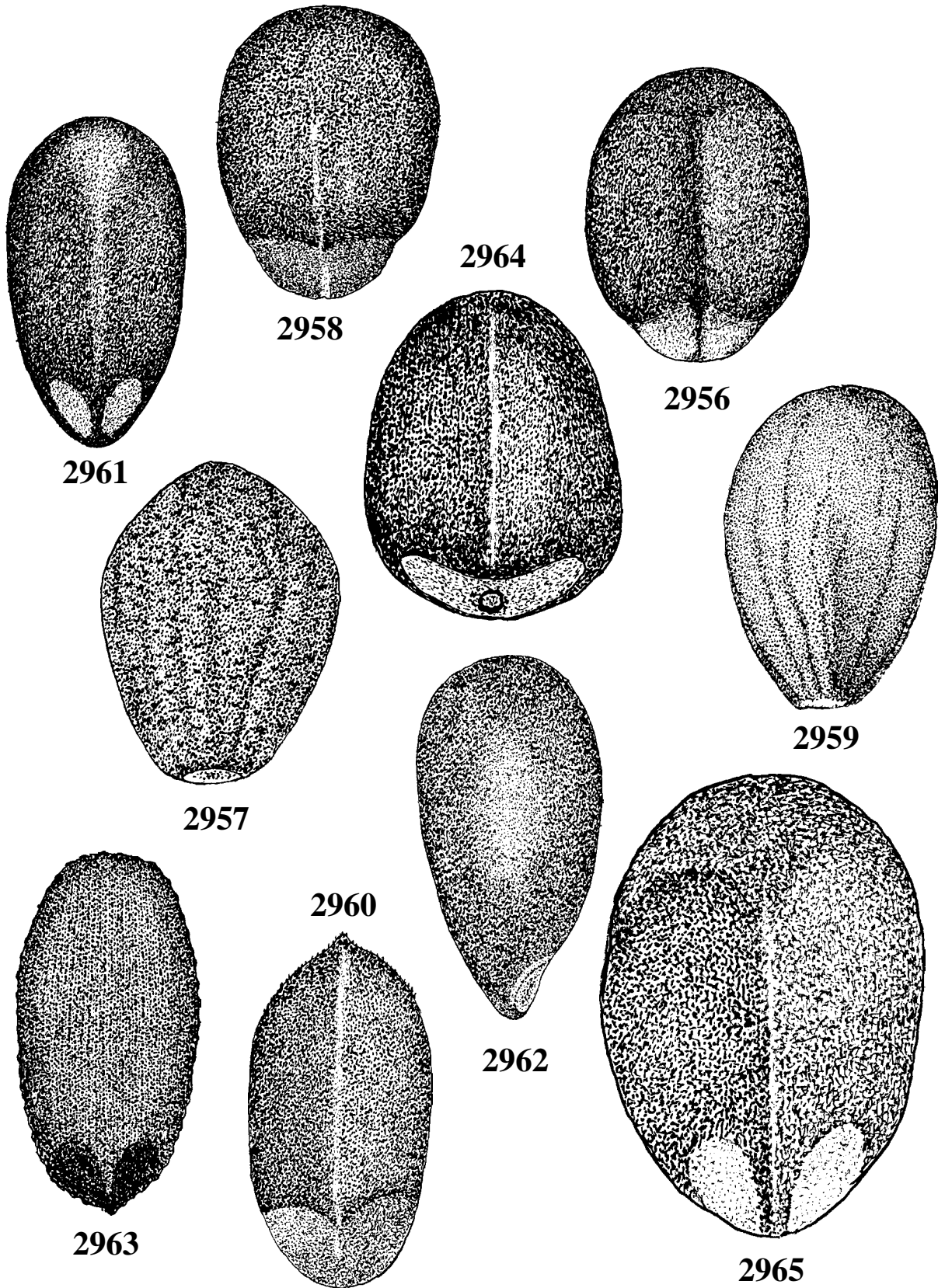
**2961. *Acinos alpinus*** (L.) Moench, *Calamintha alpina* (L.) Lam. — Perennial, semishrub  $\pm$  glabrous, stems procumbent, ascendent, 10-40 cm high, ramified below. **Nutlets obovoidal to elliptic, dorsal side convex, ventral side with indistinct rib, apex rounded, base with oval hilum, 1.3-1.5 x 0.6-0.7 mm. Surface smooth to granulate, dull, dark-brown. 2n = 18.** Native to Europe, sunny calcareous rocks, screes and slopes from upland up to subalpine zones. Pl, Ro, Sk, Uk.

**2962. *Acinos arvensis*** (Lam.) Dandy, *Calamintha acinos* (L.) Clairv. — Annual up to biennial, pubescent, stems procumbent, ascendent or erect, 5-40 cm high, little branched. **Nutlets obovate to elliptic, dorsal side convex, ventral slight rooflike with indistinct rib, base narrowed with two oval hilum, 1.3-1.5 x 0.6-0.7 mm. Surface fine granulate, dull or faint lustrous, dark-brown. 2n = 18.** Native to Eurasia, dry sunny habitats of warmer areas; in all Carpathian regions.

**2963. *Acinos rotundifolius*** Pers., *A. graveolens* (M. Bieb.) Link, *Calamintha rotundifolia* (Pers.) Benth. — Annual, stems 15-30 cm high, with inflorescences covered with stander or semistander hairs, leaves obovate-orbicular, mucronate at apex. **Nutlets elliptic or ovate, slight compressed, hilum oval, 0.75-0.85 x c. 0.4 mm. Surface granulate, faint lustrous, reddish-brown.** Native to southeastern Europe, in stony open habitats. Ro.

**2964. *Calamintha grandiflora*** (L.) Moench, *Satureja grandiflora* (L.) Scheele — Perennial, sparsely hirsute, stems ascendent to erect, 20-60 cm high. **Nutlets ovate, spherical or elliptic, dorsal side convex, ventral slight rooflike with indistinct rib and double hilum, 1.4-1.6 x 1.2-1.4 mm. Surface dense granulate, lustrous, black. 2n = 22.** Native to southern Europe, mountains shady woodlands, cultivated in gardens, uniquely naturalized; throughout the Carpathians.

**2965. *Calamintha nepeta*** (L.) Savi, *C. trichotoma* Moench, *C. nepetoides* Jordan — Perennial, stems 20-60 cm high, simple or ramified, suberect or ascendent,  $\pm$  hirsute. **Nutlets elliptic, dorsal side convex, ventral slight rooflike with minute distinct rib, 1.1-1.3 x 0.8-0.9 mm. Surface fine reticulate-foveate, slight lustrous, dark-brown.** Native to central and southern Europe, open sandbanks, stony slopes and saline grounds. Hu, Mo, Ro, Uk.



**2966. *Calamintha menthifolia*** Host, *C. sylvatica* Bromf. — Perennial, downy, stems ascendent to erect, 20-80 cm high. **Nutlets ovate, globose to elliptic, dorsal side convex, ventral slight rooflike with indistinct ribs, apex rounded, 1-1.2 x 0.8-0.9 mm. Surface reticulate-foveate, slight lustrous, dark-brown. 2n = 24.** Native to Europe, light forests, overgrown rocks, forest steppes of warmer areas; throughout the Carpathians.

**2967. *Clinopodium vulgare*** (L.) Fritsch, *Calamintha clinopodium* Spenn. — Perennial, downy to hirsute, stems ascendent, 30-80 cm high, poorly ramified. **Nutlets elliptic to globose, dorsal side convex, two ventral sides flat, rooflike with indistinct rib, apex and base rounded, hilum double, 1.1-1.3 x 0.8-1 mm. Surface smooth, slight lustrous, dark-brown. 2n = 20.** Native to Eurasia, light forests, shrubberies, shady meadows, calcareous grounds; in all Carpathian territories.

**2968. *Hyssopus officinalis*** L., *H. borealis* Domin — Perennial, aromatic dwarf shrubs, stems erect, rarely decumbent, 20-60 cm high, branched. **Nutlets prolonged obovate, dorsal side convex, two ventral sides flat, rooflike, apex truncate or slight rounded, base narrowed with hilum, 2.1-2.5 x 1.2-1.4 mm. Surface reticulate-foveate, dull, black. 2n = 12.** Native to southern Europe and western Asia, dry hills and rocky grounds, cultivated in gardens, uniquely naturalized. Hu, Mo, Pl, Sk, Uk.

**2969. *Origanum vulgare*** L., *O. hirtum* Link, *O. virens* Hoffm. et Link — Perennial, glabrous or hirsute, stems ascendent or erect, 20-90 cm high. **Nutlets obovate to globose, dorsal side convex, two ventral sides rooflike with indistinct rib, base narrowed, mostly with double hilum, 0.7-0.9 x 0.5-0.6 mm. Surface granulate, slight lustrous, dark-brown. 2n = 30.** Native to Eurasia; light forests, stony and shrubby slopes, wood cut-over areas, fallows; most of the Carpathians.

**2970. *Majorana hortensis*** Moench, *Origanum majorana* L. — Annual up to perennial, erect or ascendent, 20-60 cm high, glabrous or downy, branched. **Nutlets obovate to spherical, dorsal and ventral sides convex, apex obtuse rounded, base narrowed with small hilum, 0.8-1 x 0.7-0.8 mm. Surface fine granulate, slight lustrous, brown to dark-brown. 2n = 30.** Originally growing in southwestern Asia and northern Africa, since old time cultivated as a

medical plant in flowerpots; locally naturalized in all Carpathian region.

**2971. *Thymus alpestris*** Tausch ex A. Kern., *Th. subalpestris* Klokov — Semishrub, plant with many creeping non-flowering leafy shoots, stems 4-angular, hirsute. **Nutlets globose, angular-globose, slight elliptic, small beak with hilum at base, 0.7-0.9 x 0.6-0.8 mm. Surface fine granulate dull, brown, dark-brown. 2n = 28.** Native to Europe, mostly at altitudes above 1000 m, mountain meadows, stony and rocky slopes. Cz, Pl, Ro, Sk, Uk.

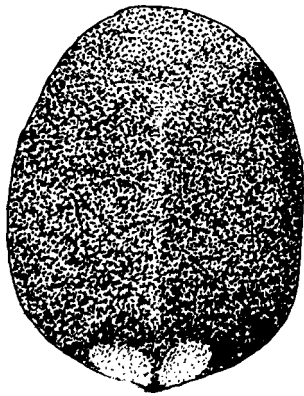
**2972. *Thymus austriacus*** (Bernh. ex Ronniger) Ronniger, *Th. glabrescent* Willd. subsp. *austriacus* (Bernh. ex Reichenb.) Soó — Perennial, stems flabby, fully greyish, hirsute, inflorescence terminal, short, much branched, 10-12 cm long. **Nutlets ± spherical, lateral slight compressed, hilum roundish on the bottom part, 0.8-0.9 x 0.7-0.8 mm. Surface fine granulate, slight lustrous, brownish-black. 2n = 56.** Native to submediterranean Europe, on sunny steppe slopes and rocks, in warmer regions.

**2973. *Thymus comosus*** Heuffel ex Griseb. — Perennial, stems semi-erect, ascendent or prostrate, woody at base. **Nutlets globose to elliptic, apex truncate-rounded, base with small beak and round hilum, 0.8-1 x 0.7-0.8 mm. Surface fine granulate, dull, brown. 2n = 56 (60).** Native to eastern Carpathians, rocky and stony slopes of the montane zone. Ro.

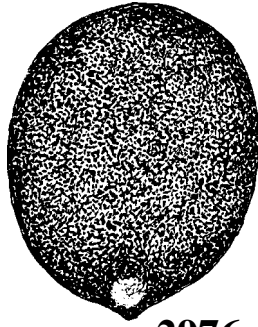
**2974. *Thymus glabrescens*** Willd. subsp. *glabrescens* — Perennial, stems weak, flowering stems numerous, 10-30 cm high, erect or ascending. **Nutlets spherical, with very small beak at base, 0.8-0.9 x 0.7-0.8 mm. Surface granulate, slight lustrous, black. 2n = 56.** Native to Europe, sunny steppe slopes and rocks of warmer areas. Hu, Pl, Ro, Sk, Uk.

**2975. *Thymus longicaulis*** Presl, *T. dalmaticus* Freyn — Perennial, stems 5-10 cm long, somewhat woody, creeping, non-flowering or with a terminal inflorescence. **Nutlets globose, roundish hilum with small beak, 0.7-0.9 x 0.6-0.7 mm. Surface granulate, dull, dark-brown.** Native to the Balkan Peninsula, bottom, sandy, grassy and stony places of the montane and the subalpine zones. Ro.

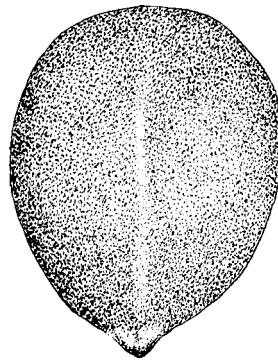
**2976. *Thymus marschallianus*** Willd. — Perennial, turf, stems erect or shortly ascendent, 20-40 cm



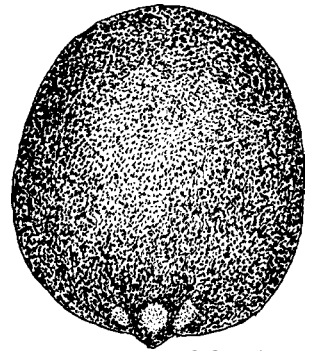
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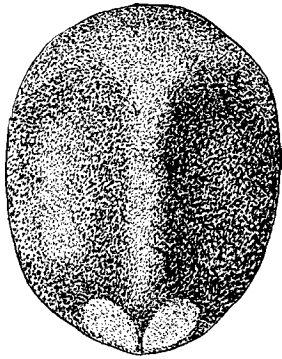
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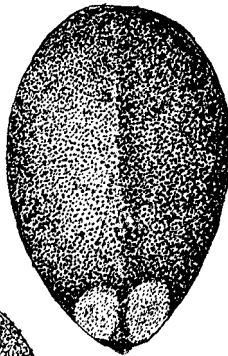
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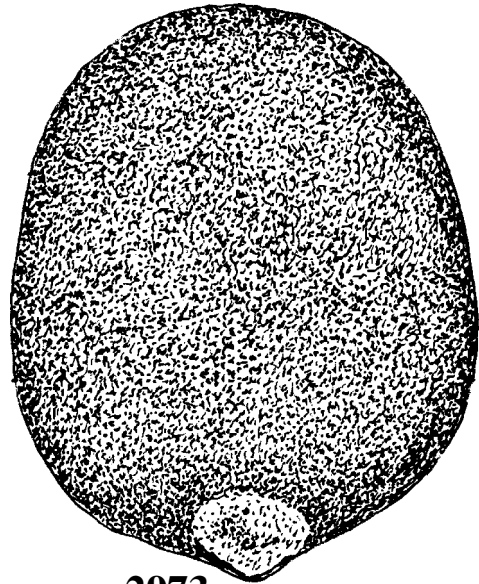
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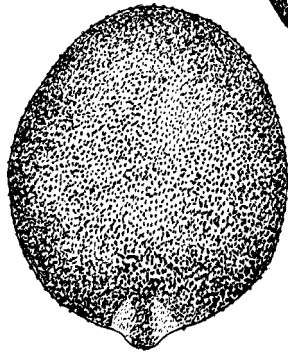
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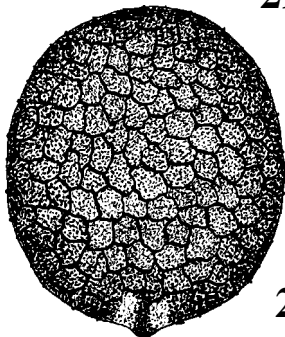
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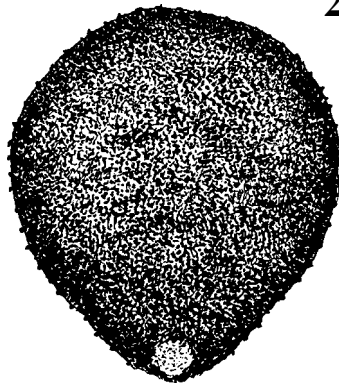
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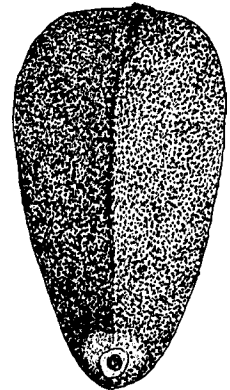
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high, hirsute. **Nutlets spherical to elliptic, base with whitish, roundish hilum with small beak, 0.6-0.7 x 0.5-0.6 mm. Surface tuberculate, slight lustrous, blackish. 2n = 28.** Native to Eurasia, sunny, steppe slopes, sandy and stony grounds; almost in all Carpathian regions.

**2977. *Thymus pallasianus*** H. Braun. — Perennial, stems erect to arcuate or procumbent, woody, creeping, flowering stems up to 15 cm high. **Nutlets globular with small beak and hilum at base, 0.8-1 x 0.8-0.9 mm. Surface fine granulate, slight lustrous, dark blackish-brown.** Native to the southern part of eastern Europe, sandy or clayey steppes. Uk.

**2978. *Thymus pannonicus*** All., *T. kosteleckyanus* Opiz, *T. hirsutus* M. Bieb. — Perennial, stems 10-30 cm high, procumbent, ends ascendent, flowering, hirsute. **Nutlets globose, base narrowed into a small beak with indistinct hilum, 0.8-1 x 0.8-0.9 mm. Surface granulate, slight lustrous, dark-brown and black. 2n = 28.** Native to Eurasia, sunny steppe slopes and dried grounds; in the whole Carpathians.

**2979. *Thymus praecox*** Opiz, *T. drucei* Ronniger — Semishrub, stems woody at base, creeping, flowering up to 10 cm high, 4-angular, hirsute. **Nutlets spherical to slight elliptic, base with small beak in indistinct hilum, 0.9-1 x 0.9-1 mm. Surface fine granulate, dull, lustrous, dark-brown. 2n = 50, 54, 56, 58.** Native to Europe, sunny, dry, grassy and stony hills and slopes from lowland up to the subalpine zones. Au, Hu, Pl, Ro.

**2980. *Thymus pulcherrimus*** Schur, *T. carpaticus* Čelak., *T. sudeticus* Opiz ex Borbás — Shrub, stems long, creeping, somewhat woody, non-flowering branches creeping, flowering stems up to 10 cm, with a basal cluster of small leaves. **Nutlets globular or slight oval, 0.7-0.9 x 0.6-0.7 mm. Surface granulate, faint lustrous, dark-brown. 2n = 56, 60.** Native to the Carpathians, on grassy and stony subalpine meadows, overgrown screes, in open places, mostly in calcareous stands. Pl, Ro, Sk, Uk.

**2981. *Thymus pulegioides*** L., *T. chamaedrys* Fries — Perennial, stems shortly procumbent or erect, woody at base, flowering stems 20-40 cm high. **Nutlets most globose to slight elliptic or ovate, with small hilum and beak at base, 0.6-0.8 x 0.6-0.8 mm. Surface smooth or very fine granulate, dull, brown to dark-brown. 2n = 28.** Native to Eurasia, light forests,

shrubberies, forest edges, boundaries, dry pastures; in all Carpathian territories.

**2982. *Thymus serpyllum*** L., *T. angustifolium* Pers. — Semishrub, stems creeping, woody at base, rooting at nodules, leafy, flowering stems c. 10 cm high, hairy. **Nutlets globose to elliptic, hilum slight rounded, 0.6-0.8 x 0.5-0.7 mm. Surface fine granulate, scabrous, dull, dark- to black-brown. 2n = 24.** Native to Europe, sandy steppe clearings, blown sands, roadsides, dry and semi-dry turfs; cultivated as a medicinal plant throughout the Carpathians.

**2983. *Thymus sibthorpii*** Benth., *T. toševii* Velen., *T. macedonicus* (Degen et Urum.) Ronniger — Perennial, flowering stems usually 10-30 cm high, erect to ascending, often branched, shortly pubescent, woody at base. **Nutlets oval to globular, 0.7-0.9 x 0.6-0.8 mm. Surface granulate, glabrous, faint lustrous, pale to dark-brown.** Native to the central part of the Balkan Peninsula. Ro (?).

**2984. *Thymus vulgaris*** L. — Semishrub, stem woody at base, ramified, 20-40 cm high. **Nutlets globose to oval, base prolonged into small beak with rounded hilum, 0.8-1 x 0.7-0.9 mm. Surface fine granulate, lustrous, dark-brown to black. 2n = 30.** Native to the Mediterranean; often cultivated as a spice plant in gardens and flowerpots, uniquely naturalized.

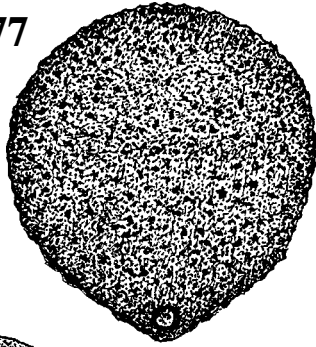
**2985. *Thymus zygioides*** Griseb., *T. carnosulus* Velen. — Perennial, flowering stems 2-8 cm, in rows on long, creeping, woody branches which bear axillary leaf-clusters distally. **Nutlets obovate, 0.7-0.8 x 0.5-0.6 mm. Surface smooth, lustrous, pale to dark-brown.** Native to the eastern part of the Balkan Peninsula, on rocky calcareous stands, arid lowlands, sandbanks. Ro.

**2986. *Lycopus europaeus*** L., *L. mollis* A. Kerner — Perennial, 20-120 cm high, scattered to densely hirsute, distinctly angular. **Nutlets obovate trapeziform, flattish, dorsal side slight convex, ventral nearly flat, broad and thick marginate around, apex truncate, base with distinct hilum, 1.3-1.5 x 0.9-1.1 mm. Surface fine wrinkly, slight lustrous, dark-brown. 2n = 22.** Native to Eurasia, reed swamps, margins of stagnant or flowing waters, ditches, marshy woodlands, flooded places; in all Carpathian regions.

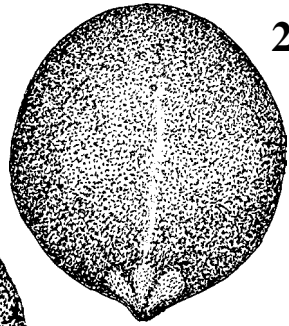
**2987. *Lycopus exaltatus*** L. fil. — Perennial, stems 80-150 cm high, robust, distinctly angular, ramified.



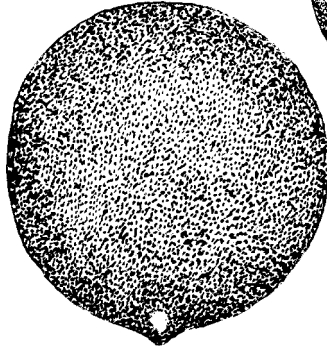
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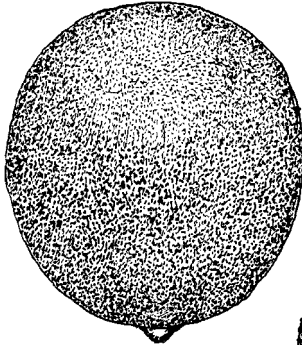
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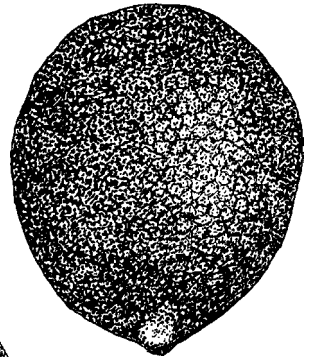
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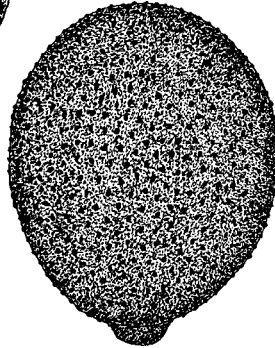
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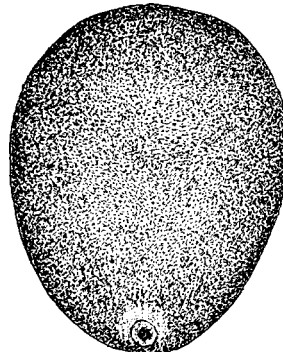
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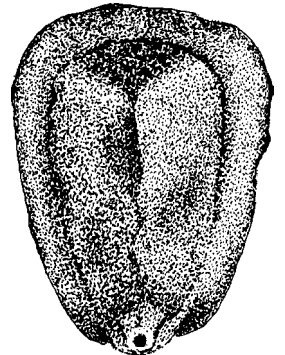
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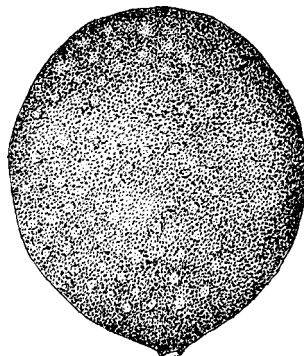
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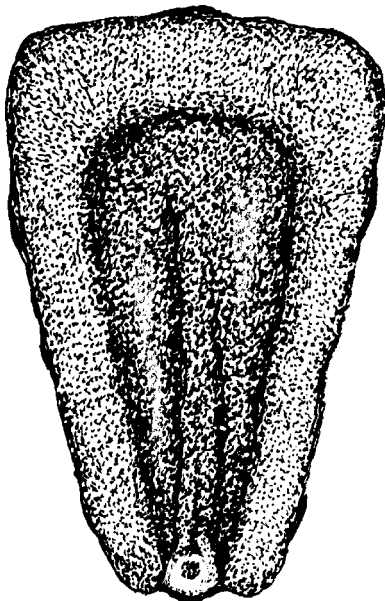
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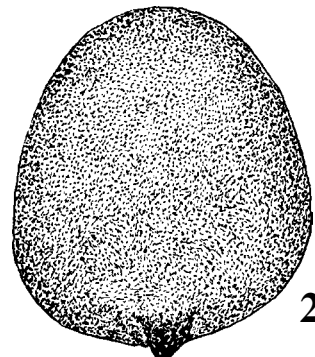
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2987



2983



**Nutlets obovate or trapeziform, very similar to *L. europaeus* but narrower, 1.3-1.5 x 0.8-1 mm. 2n = 22.** Native to Eurasia, lowland wet forests, coastal shrubberies, flooded places; throughout the Carpathians.

**2988. *Mentha aquatica* L., *M. hirsuta* Hudson** — Perennial, tomentose to glabrous, aromatic, stems 20-100 cm high. **Nutlets ovate to elliptic, dorsal side convex, ventral rooflike, apex roundish, base obtusely acuminate with round hilum, 0.9-1 x 0.6-0.8 mm. Surface smooth or fine warty, rare hairy at the apex, dull, pale-brown. 2n = 96.** Native to Europe, margins of running and still waters, ditches, wet fields and meadows, muddy calcifugous soils; throughout the Carpathians.

**2989. *Mentha arvensis* L., *M. austriaca* Jacq.** — Perennial, seldom annual, hirsute up to glabrous, stems procumbent or ascending, 20-60 cm high, ramified. **Nutlets ovate to elliptic, apex rounded, base obtuse acuminate, hilum large, 0.8-1 x 0.6-0.7 mm. Surface dull, reticulate-foveate, pale-brown. 2n = 72.** Native to Europe, common especially in arable fields and damp places, from lowland to mountain zones; in all Carpathian territories.

**2990. *Mentha longifolia* (L.) Huds., *M. sylvestris* L., *M. incana* Willd.** — Perennial, stems 40-120 cm high, lanate or hirsute. **Nutlets obovate, elliptic or globose, ventral side indistinctly rooflike, apex rounded, sometimes with hairs, base narrowed, 0.6-0.7 x 0.5-0.6 mm. Surface reticulate-foveate, slight lustrous, pale- to dark-brown. 2n = 24.** Native to Eurasia, banks of streams, wet meadows, mountain pastures, damp fields, ditches, calcareous soils; in all Carpathian territories.

**2991. *Mentha pulegium* L., *Pulegium vulgare* Mill.** — Perennial, glabrous to tomentose, aromatic, stems ascendent to erect, 10-40 cm high, branched. **Nutlets ovate, trigonous with hilum at base, 0.6-0.8 x 0.5-0.6 mm. Surface reticulate-foveate, slight lustrous, brown. 2n = 20.** Native to the Mediterranean, muddy places, water reservoir banks, overflowing meadows; in the whole Carpathians.

**2992. *Mentha spicata* L., *M. crispa* L., *M. viridis* (L.) L.** — Perennial, aromatic, stems erect, 30-100 cm high, ramified. **Nutlets ovate to elliptic, apex rounded, often with small tip or hairs, base narrowed with large hilum, 0.7-0.8 x 0.5-0.6 mm. Surface reticulate-foveate, dull, dark-brown. 2n = 48.**

Origin unknown, long time ago cultivated as a medicinal plant in gardens or in flowerpots; naturalized in most part of Europe, inclusive the Carpathians.

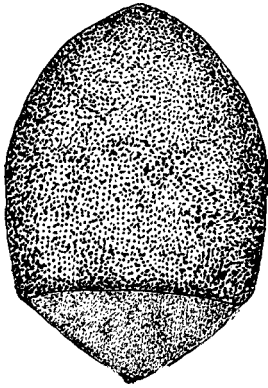
**2993. *Mentha suaveolens* Ehrh., *M. rotundifolia* auct. non (L.) Huds., *M. macrostachya* Ten.** — Perennial, aromatic, stems 40-100 cm high, hirsute to downy. **Nutlets slight prolonged elliptic, ventral side indistinct rooflike, apex rounded to slight narrowed, base narrow to acuminate, 0.7-0.8 x 0.5-0.6 mm. Surface reticulate-foveate, faint lustrous, dark- to blackish-brown. 2n = 24.** Native to the Mediterranean, cultivated in gardens, as a pot-herb and also a medicinal plant; rarely naturalized in all Carpathian regions.

**2994. *Mentha x gentilis* L.** — Perennial, stems 30-80 cm high, usually glabrous, often red-tinged, aromatic, pyramidal ramified. **Nutlets ovate, with hilum below, 0.6-0.7 x 0.4-0.5 mm. Surface reticulate-foveate, slight lustrous, dark-brown. 2n = 54, 60, 84, 96, 108, 120.** A hybrid originated in culture (*M. arvensis* x *spicata*), frequently cultivated throughout the Carpathians, often escaping.

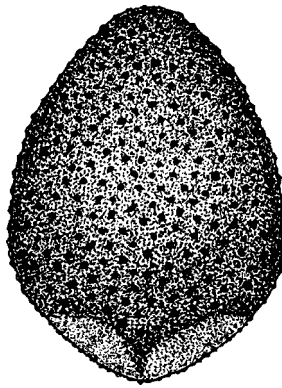
**2995. *Mentha x piperita* L.** — Perennial, glabrous to hairy, aromatic, stems 30-80 cm high. **Nutlets ovate, elliptic to globose, with narrowed apex and base, hilum large, 0.6-0.8 x 0.5-0.6 mm. Surface smooth to fine reticulate-foveate, lustrous, dark-brown. 2n = 84, 120.** Hybrid (*M. aquatica* x *spicata*), long time ago cultivated as a medicinal and commonly naturalized in nature; throughout the Carpathians.

**2996. *Mentha x rotundifolia* L., *M. rugosa* —** Perennial, stems 30-60 cm high, their bases procumbent, shoots ascendent, ramified at the apex. **Nutlets obovate to spherical, slight compressed, ventral side rooflike, indistinct, hilum large, 0.6-0.7 x 0.5-0.6 mm. Surface reticulate-foveate, slight lustrous, dark-brown. 2n = 24.** Hybrid (*M. longifolia* x *suaveolens*) occurrence very variable in central, southern and eastern Europe, overgrown places, roadsides, boundaries; rarely cultivated. Pl, Ro, Sk.

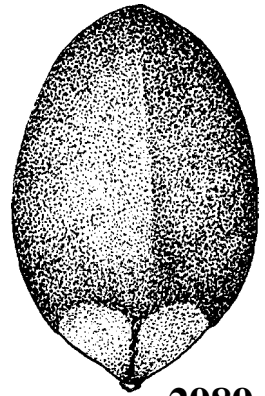
**2997. *Perilla frutescens* (L.) Britton, *P. ocymoides* L.** — Annual, robust plant, 60-100 cm high, stems erect, longitudinally furrowed, 4-angular. **Nutlets broad obovate to spherical, 2.3-2.7 x 2-2.3 mm. Surface reticulate veinous, dull, light greyish-brown up to brown.** Native to the Himalayas, in



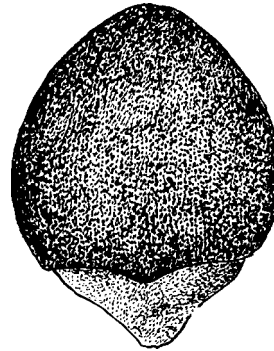
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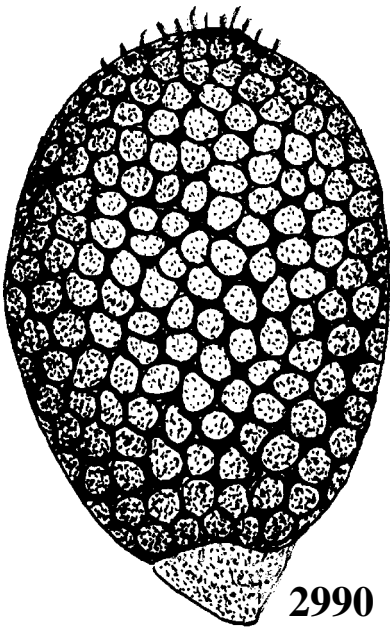
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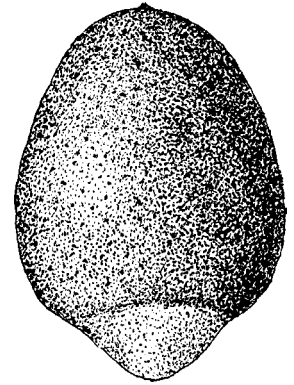
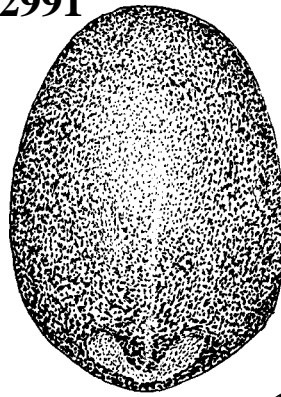


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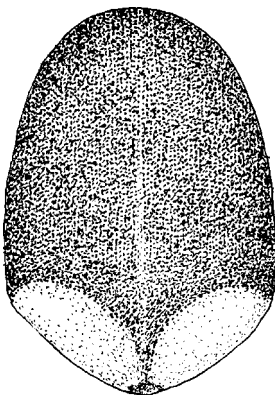


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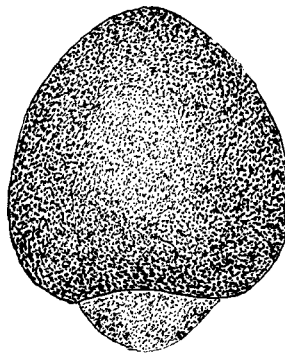
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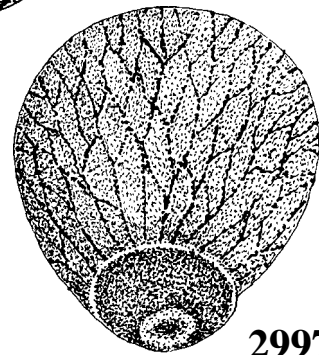
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2988



2996



2997

southeastern Europe cultivated as an ornamental and also for its aromatic oil, locally naturalized. Uk.

**2998. *Perilla nankinensis*** (Lour.) Decne, *Dentidia nankinensis* Lour. — Perennial, stems erect, longitudinally furrowed, 50-100 cm high, leaves ovoid-cuneiform. **Nutlets  $\pm$  broad obovate, globular, bottom narrowed with a large hilum, 1.4-1.7 x 1.3-1.6 mm. Surface reticulate venous, faint lustrous, pale-brown.** Native to Asia (the Himalayas); in the Carpathians rarely cultivated as an ornamental or in distillation of aromatic substances. Uk.

**2999. *Rosmarinus officinalis*** L. — Semishrub, rarely procumbent, aromatic, stems erect or ascendent, sempervirent, 60-150 cm high. **Nutlets ovate or elliptic, apex round, base with large whitish hilum, 2.6-3 x 1.5-1.7 mm. Surface slight wrinkly, dull, dark-brown.  $2n = 24$ .** Native to the Mediterranean, mostly in dry scrubs; often cultivated for ornament or for its aromatic oil in gardens and flowerpots.

**3000. *Horminum pyrenaicum*** L. — Perennial, stems erect, unbranched, pubescent, up to 45 cm high, flowers dark bluish-violet. **Nutlets  $\pm$  spherical, dorsal side convex, ventral rooflike, mostly flat with indistinct margin, 1.7-1.9 x 1.3-1.5 mm. Surface smooth or very short white-haired, dull, dark-brown.  $2n = 12$ .** Native to the Alps and the Pyrenees, mountain grassy places, calcicole; in the Carpathians rarely cultivated in gardens for its flowers.

**3001. *Salvia aethiopsis*** L., *Sclarea aethiopsis* (L.) Mill. — Biennial or perennial, aromatic lanate, stems erect, 50-150 cm high, ramified. **Nutlets obovate, dorsal side convex, ventral rooflike, base with round hilum, 2.1-2.5 x 1.6-1.8 mm. Surface fine wrinkly, lustrous, violetish-brown with darker longitudinal veins on dorsal and ventral sides.  $2n = 24$ .** Native to southern and eastern Europe, steppe and stony slopes, roadsides, pastures, as a weed on fields. Hu, Mo, Ro, Sk, Uk.

**3002. *Salvia argentea*** L. — Perennial, stems 15-80 cm high, simple, erect, shortly hirsute, much branched. **Nutlets obovate to elliptic, ventral side  $\pm$  rooflike with indistinct rib, base narrowed with round hilum, 2.9-3.3 x 2.1-2.3 mm. Surface wrinkly, dull to slight lustrous, dark-brown with darker net of veins.  $2n = 22$ .** Native to the Balkan Peninsula, stony

and rocky slopes; in the Carpathians planted solitary in sunny places of parks. Sk, Uk.

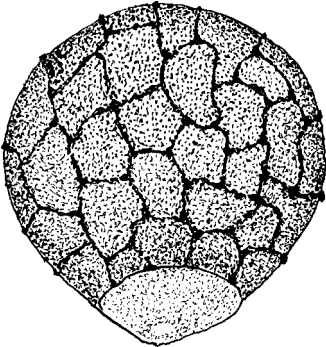
**3003. *Salvia austriaca*** Jacq., *Sclarea distans* Moench — Perennial, lanate below, granular-hirsute above, stems erect, mostly simple, up to 100 cm high. **Nutlets ovate, obovate to elliptic, ventral side slight rooflike, base with round hilum, 2-2.3 x 1.5-1.7 mm. Surface fine wrinkly, dull, dark-brown.  $2n = 14$ .** Native to Eurasia, dry pastures, boundaries, forest edges and shrubberies, waste places. Br, Hu, Mo, Ro, Sk, Uk.

**3004. *Salvia dumetorum*** Andr. ex Besser, *S. stepposa* Schost. — Perennial, stems 40-65 cm high, glabrous, leaves oblong-lanceolate. **Nutlets  $\pm$  spherical, dorsal side convex, ventral slight rooflike, flat, 2-2.2 x 1.7-1.9 mm. Surface fine waved, lustreless, dark- to blackish-brown.** Native to Europe and southwestern Asia, on steppe, stony slopes, sometimes cultivated as a honey-plant. Mo, Pl, Ro, Uk.

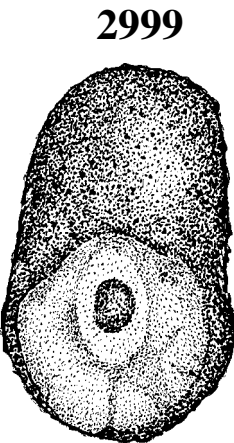
**3005. *Salvia glutinosa*** L., *Sclarea glutinosa* (L.) Mill. — Perennial, glandular-viscid above, stem erect, 50-100 cm high, little ramified. **Nutlets obovate or elliptic, dorsal side convex with 3-4 longitudinal veins, ventral side slight rooflike, rib indistinct, base with oval hilum, 3-3.4 x 2-2.2 mm. Surface fine wrinkly dull, brown.  $2n = 16$ .** Native to Europe, shady woods, shrubberies on calcareous grounds, mainly in mountain areas of the whole Carpathians.

**3006. *Salvia nemorosa*** L., *S. sylvestris* Jacq. non L. — Perennial, pubescent, stems erect, 30-60 cm high, little ramified. **Nutlets obovate, elliptic to spherical, slight depressed, dorsal and ventral sides convex, indistinct rooflike, base with round fall in hilum, 1.3-1.5 x 1-1.2 mm. Surface fine wrinkly, dull, blackish-brown.  $2n = 14$ .** Native to Europe, dry pastures, boundaries, roadsides, forest margins and shrubberies; throughout the Carpathians. Hu, Mo, Pl, Ro, Sk, Uk.

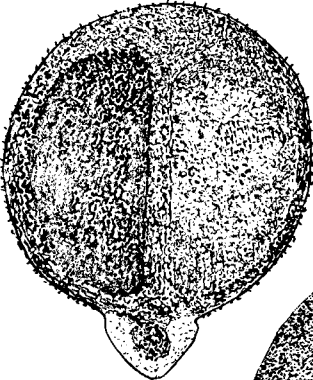
**3007. *Salvia nutans*** L. — Perennial, stems 20-150 cm high, erect, simple or ramified only above. **Nutlets ovate, elliptic, dorsal side convex, two ventral sides  $\pm$  flat, rooflike, base narrowed with round fall in hilum, 2.1-2.4 x 1.6-1.8 mm. Surface fine wrinkly, dull, brown.** Native to southeastern Europe, arid coasts, meadows, calcareous places, shrubs, steppes, cereals. Hu, Mo, Pl, Ro, Sk, Uk.



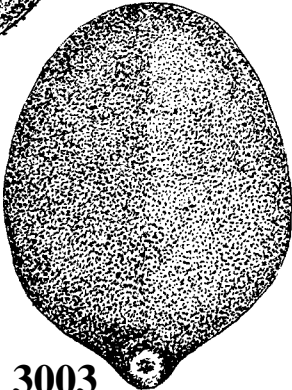
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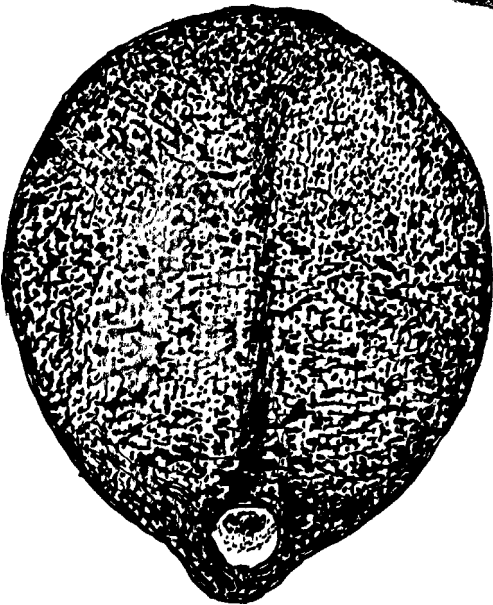
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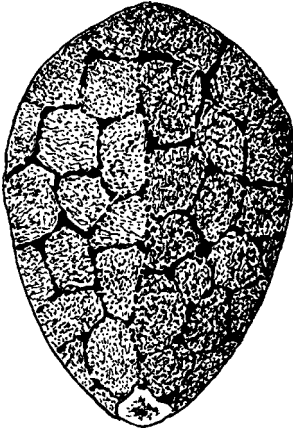
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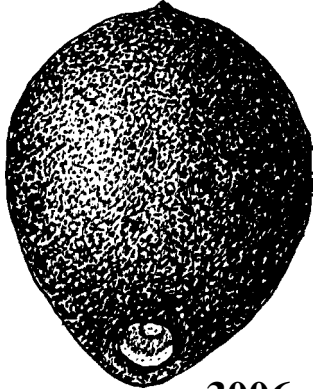
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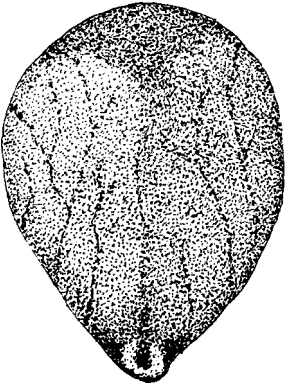
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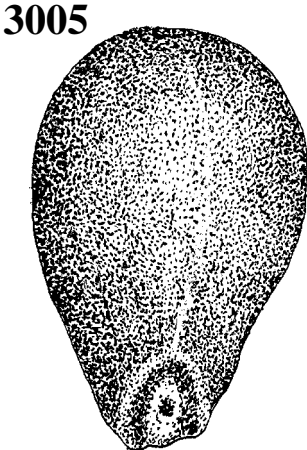
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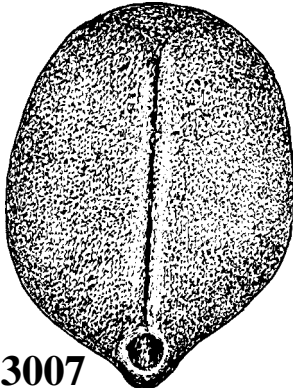
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3005



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**3008. *Salvia officinalis* L., *S. tomentosa* Mill.** — Semishrub, aromatic, stems erect, 20-60 cm high, much ramified, with numerous patent-tomentose branches. **Nutlets nearly spherical or slight elliptic, convex ventral side mostly with indistinct furrow, base with large round hilum, 2.4-2.8 x 2.2-2.4 mm. Surface very fine wrinkly, slight lustrous, blackish-brown.  $2n = 14$ .** Originally growing in the Mediterranean; since old times cultivated in gardens as a medical plant or as a pot-herb for ornament, rarely escaping on to dry grassy slopes. Cz, Hu, Ro, Sk, Uk.

**3009. *Salvia pratensis* L., *Plethiosphace pratensis* (L.) Opiz** — Perennial, hairy, stems erect or ascendent, 20-80 cm high, little ramified. **Nutlets ovate or obovate to spherical, with round hilum at base, 1.8-2.5 x 1.4-1.7 mm. Surface very fine wrinkly, dull, dark- to blackish-brown.  $2n = 18$ .** Native to Europe, dry meadows and pastures, stony, rocky slopes, forest margins and shrubberies; in all Carpathian territories.

**3010. *Salvia reflexa* Hornem., *S. lanceolata* Brouss.** — Bare to hairy, stems 20-50 cm high, erect or ascendent, ramified. **Nutlets elliptic, dorsal side convex, ventral rooflike with indistinct round rib, base with small, oval hilum, 2.1-2.5 x 1.4-1.6 mm. Surface very fine wrinkly, lustrous, yellowish-brown.  $2n = 20$ .** Originally growing in North America, hauling into Europe with cereals. Ro, Uk.

**3011. *Salvia ringens* Sibth. et Sm.** — Perennial, stems erect, 25-60 cm high, simple, ramified above, woody at base. **Nutlets trigonous, elliptic to spherical, dorsal side convex, ventral sides flat, rooflike, apex with excrescences, base with round hilum, 3.6-4.1 x 2.5-2.8 mm. Surface fine wrinkly, dull, glabrous, blackish-brown.** Native to the Balkan Peninsula and Asia Minor, overgrown rocks and dry places. Ro.

**3012. *Salvia sclarea* L., *Aethiopis sclarea* (L.) Opiz** — Biennial to perennial, glandular-hairy above, aromatic, stems erect, up to 120 cm high, branched. **Nutlets obovate to elliptic, dorsal side convex, ventral slight rooflike, base with round fall in hilum, 2.2-2.6 x 1.5-1.7 mm. Surface fine wrinkly, lustrous, brown with darker net of veins.  $2n = 22$ .** Native to the Mediterranean, rocky slopes, meadows, as a weed among cereals and in gardens. Hu, Ro, Sk, Uk.

**3013. *Salvia splendens* Ker-Gawl.** — Annual to perennial, stems 30-100 cm high, erect, branched, glabrous. **Nutlets obovate, dorsal side convex, ventral slight**

**rooflike with indistinct or convex rib, apex truncate with 2-3 outgrowths, 3-3.6 x 1.8-2 mm. Surface glabrous, dull, pale-brown with dark-brown spots.** Native to South America (Brazil); in the Carpathians rarely cultivated as an ornamental plant in gardens and parks. Hu, Mo, Ro, Sk, Uk.

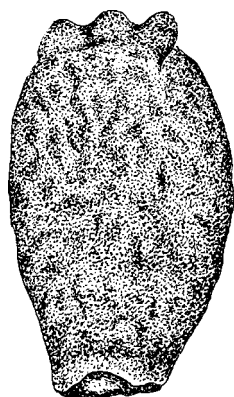
**3014. *Salvia tesquicola* Klokov et Pobed., *S. taurica* Bess.** — Perennial, stems hirsute and glandular from base. **Nutlets globose-trigonous, ventral side convex or  $\pm$  rooflike, apex rounded, base narrowed with round fall in hilum, 1.6-2 x 1.2-1.4 mm. Surface fine wrinkly, pale- to dark-brown, dorsal side with 3-5 longitudinal veins.** Native to the Balkan Peninsula and Asia Minor, steppes, steppe slopes, dry meadows, waste places. Uk.

**3015. *Salvia transsilvanica* Schur., *S. baumgartenii* Heuff.** — Perennial, stems 30-70 cm high, erect or ascendent, ramified above. **Nutlets slight elliptic to obovate, dorsal and ventral sides convex, base narrowed with round fall in hilum, 1.8-2.2 x 1.5-1.7 mm. Surface wrinkly, dull, blackish-brown.** Native and endemic to Romania, dry, arid places. Ro.

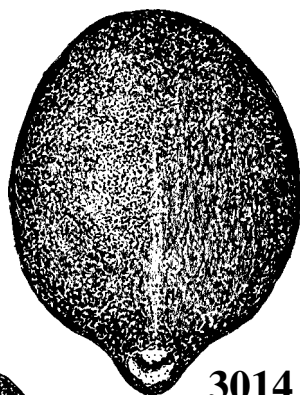
**3016. *Salvia verbenaca* L., *S. cladestina* L.** — Perennial, stems 10-80 cm high, erect, simple or ramified, pubescent below, glandular above. **Nutlets obovate, elliptic, rare spherical, dorsal and ventral sides convex, rare rooflike on ventral side, base with round fall in hilum, 2.1-2.4 x 1.6-1.9 mm. Surface fine wrinkly, dull, blackish.  $2n = 42, 64$ .** Native to western Europe; rarely hauling into the Carpathians. Ro, Sk, Uk.

**3017. *Salvia verticillata* L.** — Perennial, stems erect, 30-80 cm high, mostly simple, hairy. **Nutlets prolonged elliptic to ovate, or obovate, slight, flattish, dorsal side convex, ventral rooflike with indistinct rib, with round hilum at base, 1.6-2 x 1.1-1.3 mm. Surface very fine wrinkly, lustrous, pale- to dark-brown, dorsal side with some dark-brown veins.  $2n = 16$ .** Native to Eurasia, dry places, roadsides, along railways, pastures, boundaries, forest margins, slopes and shrubberies; throughout the Carpathians.

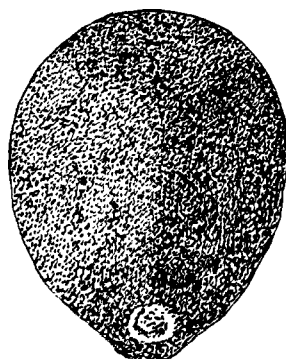
**3018. *Salvia villicaulis* Borbás, *S. amplexicaulis* Rchb.** — Perennial, stems 60-120 cm high, erect or ascendent, ramified, densely hirsute. **Nutlets mostly globose to elliptic, two ventral sides  $\pm$  flat, rooflike with longitudinal rib, base with round hilum,**



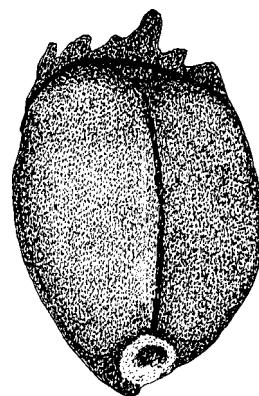
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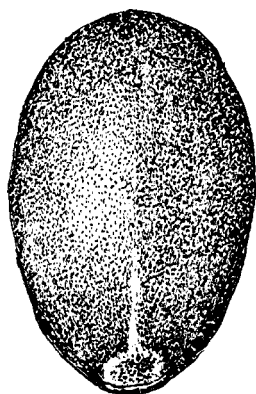
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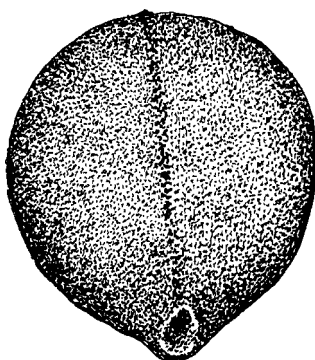
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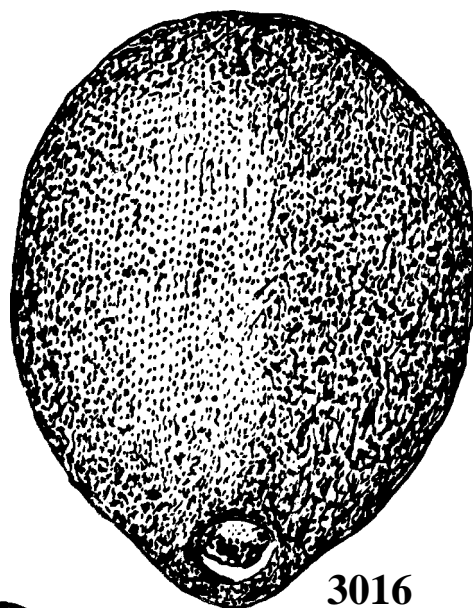
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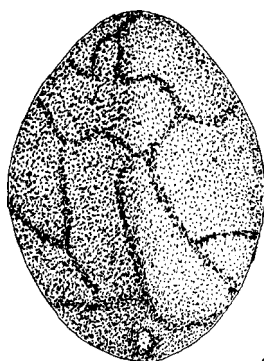
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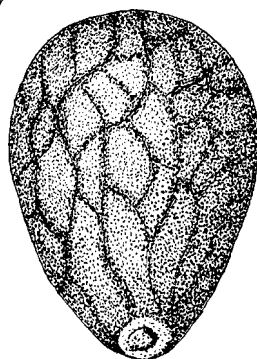
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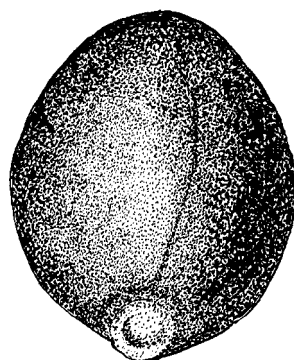
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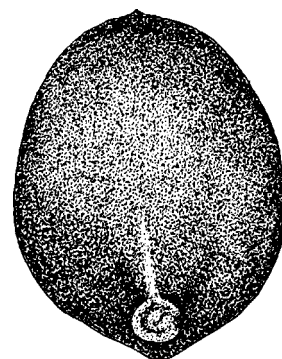
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**1.5-1.7 x 1.3-1.5 mm. Surface wrinkly, dull, dark-brown.** Native to the Balkan Peninsula, dry grassy places, rocky slopes, roadsides, shrubberies. Ro.

**3019. *Salvia viridis* L., *S. horminum* L.** — Annual to biennial, lanate, stems erect, 20-50 cm high, simple or branched. **Nutlets elliptic, slight flattish, dorsal and ventral sides convex, apex rounded, base narrowed with round hilum, 2.5-2.9 x 1.4-1.7 mm. Surface very fine wrinkly, dull, blackish-brown.** Native to the Mediterranean, dry places, fields and roadsides; in central Europe cultivated as an ornamental in garden flower-beds.

**3020. *Lavandula angustifolia* Mill., *L. officinalis* L.** em Chaix, *L. vera* DC. — Shrub, up to 1-2 m high, tomentose, aromatic, stems erect, branched, woody. **Nutlets oblong-elliptic, biconvex, apex roundish, bottom with large hilum, 2-2.4 x 1.1-1.4 mm. Surface glabrous, glossy, chocolate-brown. 2n = 36, 54.** Native to the Mediterranean; in the Carpathians widely cultivated for ornament and for perfumes. Hu, Mo, Ro, Sk, Uk.

**3021. *Lavandula latifolia* (L. fil.) Medic.** — Perennial, shrubs up to 100 cm or higher, densely tomentose. **Nutlets prolonged elliptic, slight flattish, apex rounded, base truncate with large whitish hilum, 1.9-2.3 x 1-1.2 mm. Surface fine waved, lustrous, dark-brown.** Native to the western Mediterranean (Portugal); in the Carpathians rarely cultivated as an ornamental in gardens.

**3022. *Lavandula multifida* L.** — Perennial, up to 100 cm high, grey-tomentose and sometimes with long straight hairs. **Nutlets ovate, compressed, dorsal and ventral sides slight convex, bottom ventral side with large white hilum, 1.6-2 x 1.1-1.3 mm. Surface fine waved, dull, pale- or dark-brown.** Native to the western part of the Mediterranean; in the Carpathians rarely cultivated for ornament in gardens.

**3023. *Elsholtzia ciliata* (Thunb.) Hyl., *E. cristata* Willd., *E. patrinii* (Lepech.) Garcke** — Annual, almost subglabrous or puberulent, stems erect, 30-70 cm high, ramified. **Nutlets obovate, dorsal side convex with weak distinct stripes, apex blunt round, base narrowed into beak with round hilum, 1.1-1.4 x 0.6-0.8 mm. Surface wrinkly, dull, pale-terracotta.** Originally growing in Asia, rocky slopes; formerly cultivated as a spice and a weed in cereals. Mo, Pl, Ro, Sk, Uk.

**3024. *Elsholtzia fruticosa* (D. Don) Rehd.** — Semishrub, robust, ramified and hirsute plant. **Nutlets elliptic, two ventral sides ± flat, rooflike, apex rounded, base with beak, hilum and membranous wing, 1.7-2 x 0.7-0.8 mm. Surface fine wrinkly, dull, brickly-brown.** Originally growing in the Himalayas, temperate zone, rarely cultivated in gardens.

**3025. *Ocimum basilicum* L.** — Annual, bare or hairy, aromatic, stem erect, 10-40 cm high, ramified. **Nutlets elliptic, dorsal side with longitudinal rib, ventral slight rooflike or convex, base with whitish oval hilum, 1.8-2.4 x 1.2-1.5 mm. Surface wrinkly, slight lustrous, blackish-brown. 3n = 48.** Originally growing in southern Asia, in the part often cultivated as a spice in gardens, at present uniquely naturalized.

**3026. *Ocimum canum* Sims.** — Annual, stems 45-60 cm high, lower part covered with long hairs, inflorescences whitish-scabrous, leaves oval, whole-leaved or indistinctly dentated. **Nutlets oblong-ovoid, slight compressed, 2.1-2.5 x 1.2-1.4 mm. Surface fine granulate, faint lustrous, black.** Native to tropical Africa and southern Asia; in the Carpathians cultivated for etheric oil in parks and gardens.

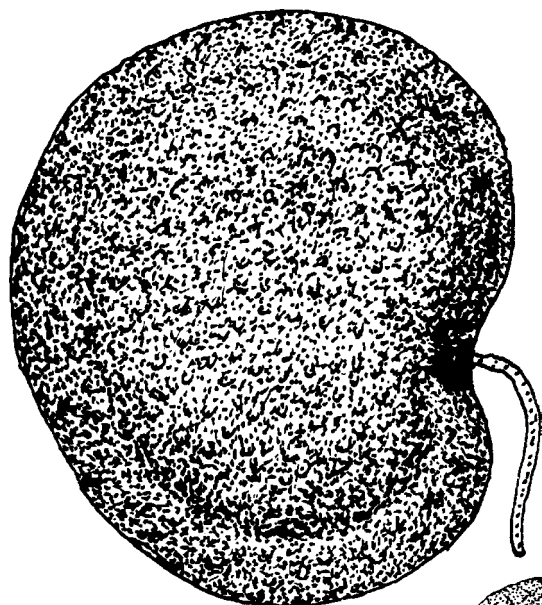
**3027. *Coleus blumei* Benth., *Ocimum scutellarioides* L.** — Perennial, stems 50-80 cm high, angular, woody at base. **Nutlets spherical to slight elliptic, flattish, lenticular, base with indistinct hilum, 0.9-1.1 x 0.8-1 mm. Surface smooth or wrinkly, glossy, blackish-brown.** Originally growing in Java; commonly cultivated as a decorative in flowerpots in many cvs, often called *C. hybrida* hort.

### 139. SOLANACEAE

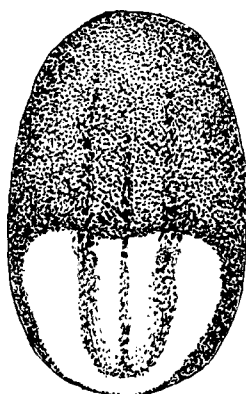
**3028. *Lycium barbarum* L., *L. halimifolium* Mill., *L. vulgare* Dumal** — Shrub, up to 2.5 m high, twigs arcuate, scarce thorny, low-pendulous. **Seeds semispherical or reniform, strong flattish, with distinct hem around, 2.5-2.8 x 2.2-2.5 mm. Surface reticulate-foveate, dull, glabrous, yellow to brown. 2n = 24.** Native to Eurasia, crisps, stony, calcifuges, nutrient-rich grounds; cultivated for hedges and often naturalized in lowland to mountain zones; in all Carpathian territories.

**3029. *Lycium chinense* Mill., *L. rhombifolium* (Moench) Dippel** — Shrub, similar to *L. barbarum*, twigs thornless or only with few thorns, up to 2.5 m high. **Seeds very similar to *L. barbarum*, hem around the seed indistinct or less expressive, 2.7-3 x 2.2-2.5 mm. Surface reticulate-foveate, slight lustrous, yellowish**

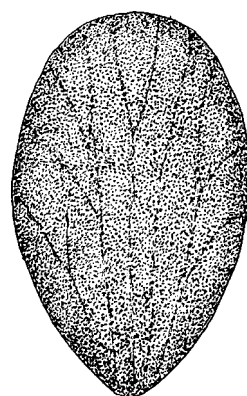




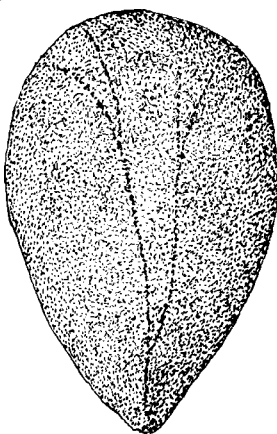
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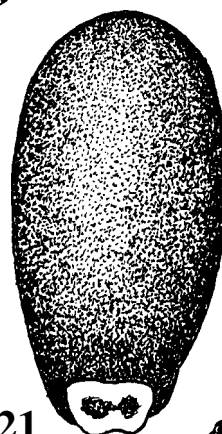
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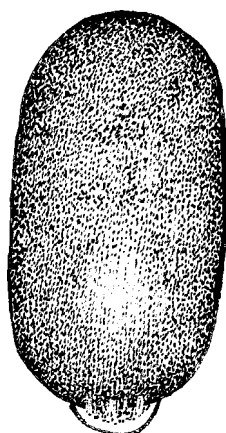
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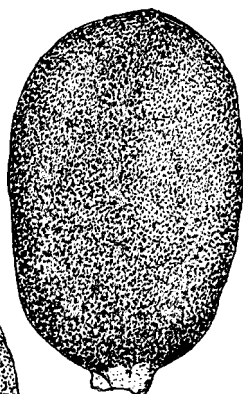
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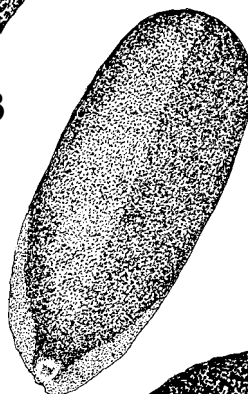
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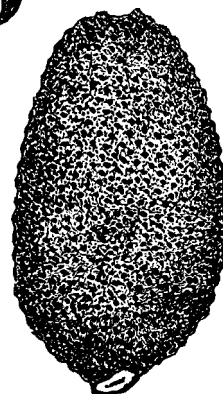
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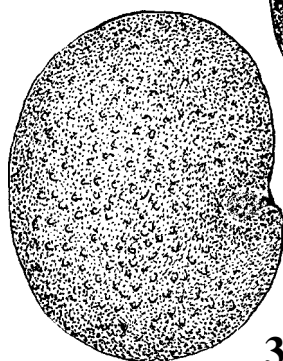
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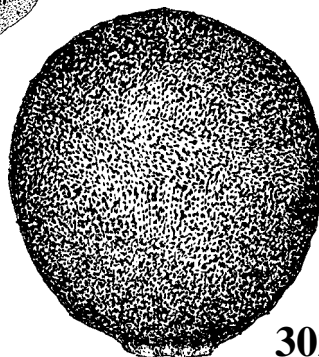
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to pale-brown.  $2n = 24$ . Native to China; in the Carpathians very rarely cultivated in parks and gardens, its escape is unknown.

**3030. *Lycium europaeum* L., *L. salicifolium* Mill.** — Shrub, up to 3-4 m high, branches rigid, very spiny, the spines stout, flowers solitary or in clusters. **Seeds reniform or semispherical, lateral compressed, dorsal side convex, ventral concave, 2.6-3 x 2.3-2.5 mm. Surface reticulate-foveate, slight lustrous, yellowish.** Native to the Mediterranean; in all Carpathians very rarely planted in parks in the warmest areas.

**3031. *Atropa bella-donna* L.** — Perennial, glabrous or glandular-pubescent, stems erect, 50-150 cm high, ramified, bluntly angular. **Seeds obovoid to reniform, lateral flattish, apex blunt rounded-off, base narrowed, 1.7-2.1 x 1.5-1.7 mm. Surface slightly lustrous or dull, reticulate-foveate, greyish-brown to brown.  $2n = 72$ .** Native to Eurasia, damp and shady places, clearings and light places of wood lands, mainly chalky soils of mountains; in all Carpathian regions.

**3032. *Scopolia carniolica* Jacq., *S. atropoides* Jacq.** — Perennial, glabrous, stems erect, 20-60 cm high, scaly below, branched above. **Seeds reniform, lateral flattish, dorsal side rounded, ventral with oval hilum, 2.5-3 x 1.8-2.2 mm. Surface reticulate-foveate, lustrous, glabrous, yellowish-brown.  $2n = 48$ .** Native to Eurasia, deciduous forests, shady slopes, valleys and rocks. Hu, Mo, Pl, Ro, Sk, Uk.

**3033. *Hyoscyamus albus* L.** — Annual to perennial, sticky pubescent, stems woody at base, 30-90 cm high, erect, ramified, patently hirsute. **Seeds obovoid to rhomboidal or orbicular, flattish, 1.2-1.4 x 1-1.2 mm. Surface reticulate-foveate, lustrous, brown or greyish-brown.  $2n = 68$ .** Native to southern Europe, fields, roadsides, waste and stony places, seldom hauling and naturalized. Mo, Ro, Uk.

**3034. *Hyoscyamus bohemicus* F. W. Schmidt, *H. pallidus* Waldst. et Kit. ex Willd.** — Annual, stems simple, glandular-downy, 15-60 cm high. **Seeds reniform to orbicular, lateral flattish, dorsal side bluntly rounded-off, 1.5-1.8 x 1.3-1.5 mm. Surface reticulate-foveate, lustrous, border part pale yellowish-brown.** Native to eastern Europe and Asia, fields, roadsides, waste places. Br, Uk.

**3035. *Hyoscyamus niger* L.** — Annual to biennial, glandular-lanate, stems erect, 20-100 cm high, simple or ramified. **Seeds reniform or obovate, lateral flattish, base stump with round hilum, 1.3-1.5 x 1.1-1.3 mm. Surface reticulate-foveate, lustrous, greyish-black.  $2n = 34$ .** Native to Eurasia, waste grounds, fallows, roadsides, loamy and sandy soils in warmer areas; throughout the Carpathians.

**3036. *Physalis alkekengi* L.** — Perennial, stems 25-100 cm high, erect, simple or branched above. **Seeds suborbicular to reniform, lateral flattish, ventral side with indistinct hilum, 2.3-2.5 x 1.9-2.1 mm. Surface reticulate-foveate, lustrous, yellow.  $2n = 24$ .** Native to Europe, forests, shrubberies, gardens, orchards, vineyards, riverbanks; in all Carpathian regions.

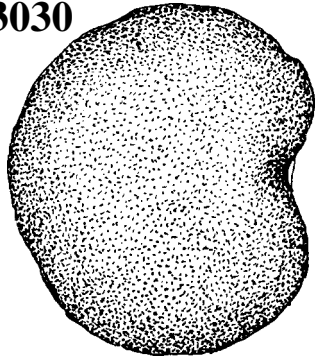
**3037. *Physalis angulata* L.** — Annual, which can be distinguished from *P. philadelphica* by the smaller yellowish-green berry, 10-12 mm. **Seeds slightly reniform, lateral compressed, narrowly winged at margin, 1.5-1.7 x 1.1-1.3 mm. Surface finely waved, glossy, yellow.** Native to tropical America; in the Carpathians rarely cultivated for its edible fruits, occasionally casual.

**3038. *Physalis franchettii* Mast.** — Perennial, plant very similar to *P. alkekengi*. **Seeds suborbicular to reniform, lateral flattish, lateral sides faint convex without distinct border, 2.6-2.8 x 2.1-2.3 mm. Surface reticulate-foveate, lustrous, yellow or reddish-brown.  $2n = 24$ .** Native to eastern Asia; often cultivated as an ornamental in gardens or in flowerpots. Sk, Uk.

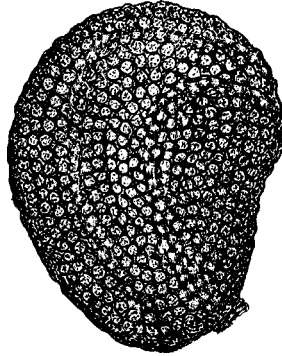
**3039. *Physalis ixocarpa* Brot. ex Hornem** — Annual, stems strongly ramified, 50-120 cm high, glabrous or hirsute in young stage. **Seeds reniform or elliptic, lateral flattish, with faint or indistinct border, 2.2-2.6 x 1.9-2.3 mm. Surface slight lustrous, reticulate-foveate, dark-yellow to yellowish-brown.** Originally growing in Mexico; in the Carpathians cultivated for fruits in some cvs. Br, Mo, Uk.

**3040. *Physalis peruviana* L., *P. edulis* Sims.** — Perennial, felted, stems 30-100 cm high, simple or ramified above. **Seeds suborbicular to reniform, lateral flattish, lateral sides slight convex, 1.9-2.2 x 1.5-1.7 mm. Surface reticulate-foveate, lustrous, yellow to pale-brown.  $2n = (24) 48$ .** Native to South America; in Europe rarely cultivated for its edible fruits and uniquely naturalized. Ro, Sk, Uk.

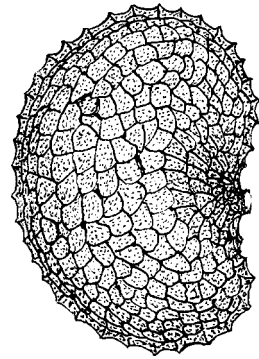
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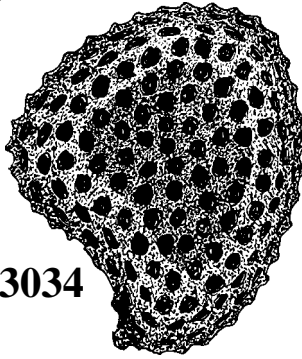
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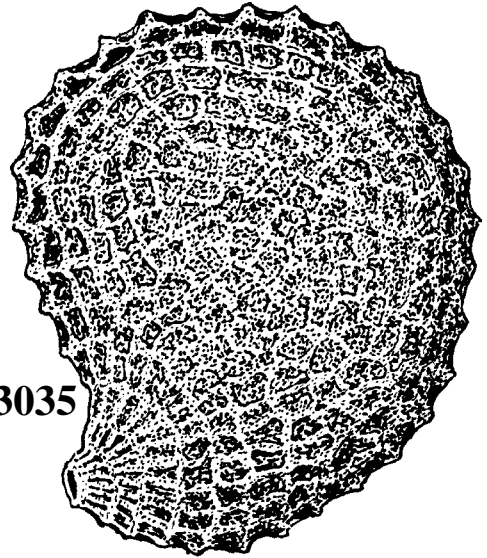
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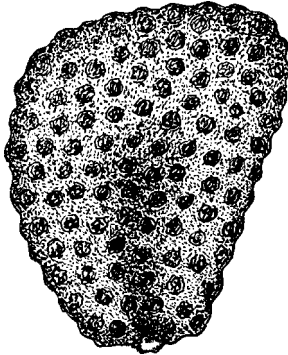
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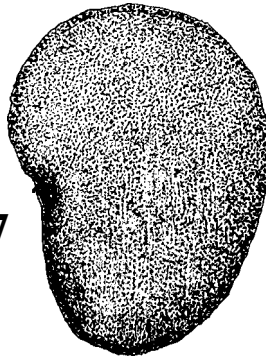
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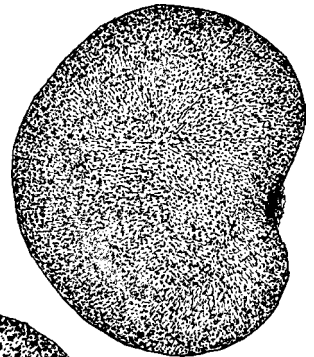
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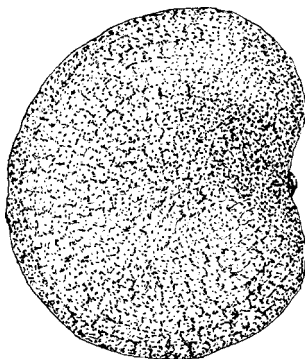
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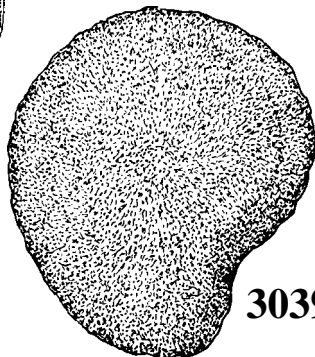
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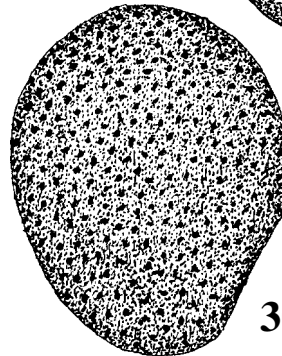
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**3041. *Physalis philadelphica*** Lam., *P. aequata* Jacq. — Annual, glabrous, stems erect, 45-60 cm high, ramified. **Seeds suborbicular to reniform, lateral flattish, mostly with slight distinct border, 2-2.2 x 1.9-2.1 mm. Surface shallow reticulate-foveate, lustrous, yellowish. 2n = 24.** Native to Mexico; in the Carpathians seldom cultivated for its edible fruits in gardens, uniquely naturalized. Sk.

**3042. *Physalis pubescens*** L. — Annual, tenderly pubescent, stems 20-90 cm high, much ramified. **Seeds obovoid, reniform or ellipsoid, lateral sides flattish, without distinct border and hilum, 1.4-1.7 x 1.1-1.3 mm. Surface lustrous, reticulate-foveate, yellowish-orange.** Native to North and South America; cultivated for its edible fruits in gardens of the Carpathian warmer areas.

**3043. *Capsicum annum*** L., *C. cerasiforme* Mill. — Annual to biennial, herbs or shrubs, stems erect, 20-100 cm high, forkedly ramified, glabrous. **Seeds suborbicular or reniform, strong compressed, 3.8-4.2 x 3.2-3.5 mm. Surface slight lustrous, glabrous, fine reticulate-foveate, dark-yellow. 2n = 24.** Originally growing in tropical America; widely cultivated as a vegetable and condiment (Pepper) in gardens, fields or under glass in many convar. (*annuum*, *longum*, *grossum*) and cvs.

**3044. *Capsicum frutescens*** L. — Shrub, up to 35-115 cm high, with elliptic leaves, the flowers in pairs or groups of 3 and greenish-white corolla. **Seeds ± rounded to flattened lenticular, or slight reniform, lateral strong compressed with stout edge, 3.9-4.5 x 3-3.4 mm. Surface fine waved, glossy, yellowish to yellow.** Native to tropical America; in the Carpathians very seldom cultivated as a vegetable and condiment, in the warmer areas.

**3045. *Solanum alatum*** Moench, *S. miniatum* Bernh. ex Willd. — Annual, stems 10-40 cm high, ramified, shoots slender, 4-angular, hirsute. **Seeds obovoid, apex blunt rounded, base with narrowed elliptic hilum, 1.5-2.2 x 1.2-1.7 mm. Surface covered with white short hairs, dull, yellowish. 2n = 48.** Native to central and eastern Europe and Asia Minor, waste places and riversides, sporadically in cultivated soils. Br, Mo, Pl, Ro, Uk.

**3046. *Solanum americanum*** Mill., *S. nodiflorum* Jacq. — Annual, distinguished from *S. nigrum* by its ± umbellate cymes, corolla 5-9 cm in diam., black-berries shiny. **Seeds obovoid, lateral compressed,**

**1.5-2 x 1.4-1.6 mm. Surface reticulate. 2n = 24.** Native to Central America; rarely casual in the Carpathians as a breeding and experimental species.

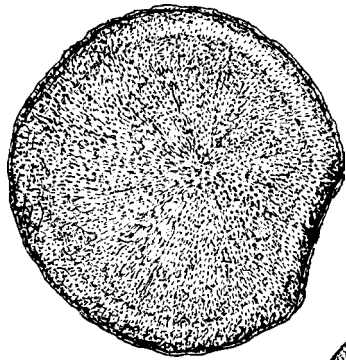
**3047. *Solanum dulcamara*** L., *Dulcamara flexuosa* Moench — Perennial, twining, glabrous, villous-tomentose, stems 30-200 cm high, woody at base. **Seeds subglobular or broad obovoid, strong compressed, base narrowed with prolonged hilum, 2.2-2.6 x 2.1-2.3 mm. Surface reticulate-foveate, lustrous, pale-yellow. 2n = 24.** Native to Eurasia, lowland wet woodlands and coastal shrubberies, screes, clearings, riverbanks; most of the Carpathians.

**3048. *Solanum hendersonii*** hort. — Shrub, up to 30 cm high, stems erect, branched, leaves lanceolate, berries reddish or yellowish. **Seeds ± reniform, lateral sides strong compressed, dorsal side convex, ventral ± flat, with impress hilum, 3.6-4 x 3-3.4 mm. Surface fine waved, slight lustrous, yellowish.** Native to South America of hybrid origin (*S. pseudocapsicum* x *capsicastrum*), cultivated for its attractive fruits as a flower-plant in interiors.

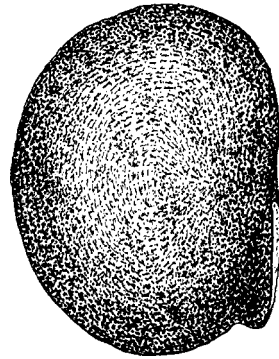
**3049. *Solanum heterodoxum*** Dun., *S. citrullifolium* A. Br. — Annual, glandularly pubescent, stems erect, 40-60 cm high, ramified, shoots spinose, spines straight, c. 5 mm, sharply pointed. **Seeds subglobose to obovoid, compressed, lateral sides flat, 2.3-2.7 x 2-2.2 mm. Surface reticulate-foveate, dull, black.** Originally growing in Texas and Mexico; rarely cultivated as an ornamental plant having flowers with purple corollas.

**3050. *Solanum laciniatum*** Aiton — Shrub, stems up to 1-1.5 m high, branched, purplish, flowers with purple corollas. **Seeds obovoid or reniform, lateral sides compressed, dorsal side convex, ventral flat, 2.4-2.6 x 1.7-1.9 mm. Surface disconnected, longitudinal furrowed, lustreless, pale- to dark-brown.** Native to Australia and New Zealand; in the Carpathians cultivated locally for its foliage which is a source of steroid precursors.

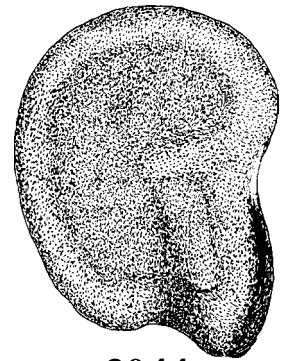
**3051. *Solanum luteum*** Mill., *S. villosum* (L.) Lam. — Annual, glabrous or lanately hirsute, hairs simple, stems erect or decumbent, 10-50 cm high, ramified. **Seeds reniform to obovoid, strong compressed, lateral sides slight convex, 1.7-2 x 1.4-1.6 mm. Surface reticulate-foveate, slight lustrous, yellowish- or reddish-brown. 2n = 48.** Native to Eurasia, woodland edges, waste places, stony roadsides, shrubberies, warm and dry areas.



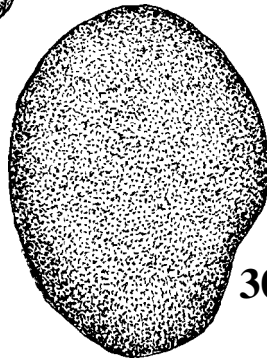
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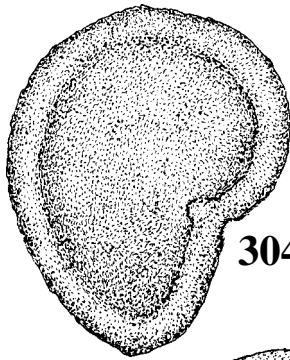
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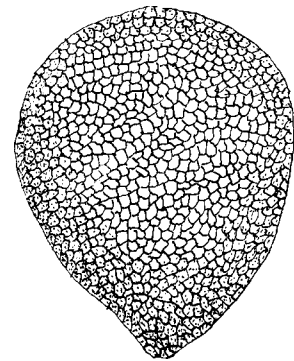
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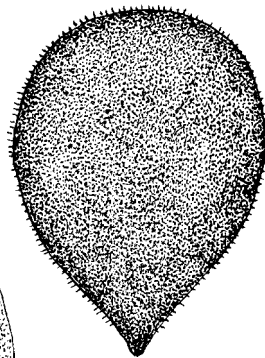
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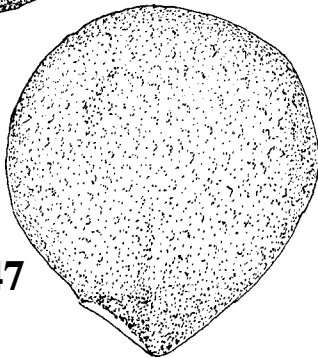
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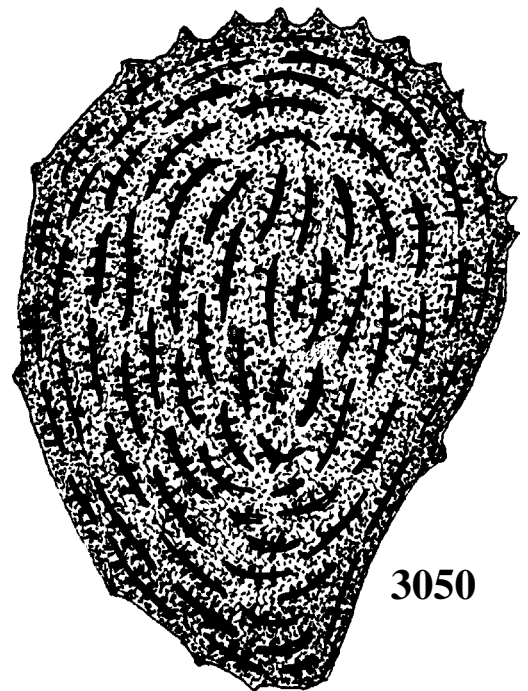
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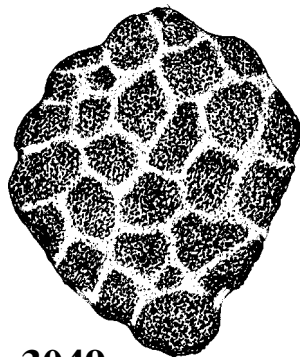
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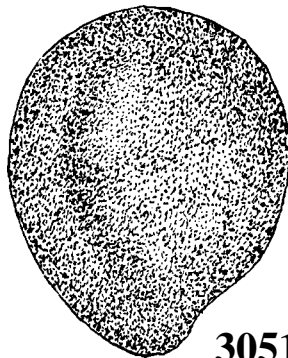
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**3052. *Solanum melongena*** L., *S. esculentum* Dunal — Annual (perennial), felty from stellate-tomentose hairs, stems erect, 30-120 cm high, ramified. **Seeds reniform to spherical, compressed, lateral sides slight convex, hilum elliptic, 3.3-3.8 x 2.7-3.1 mm. Surface reticulate-foveate, slight lustrous, light ochreous. 2n = 24, 36, 48.** Originally growing in southern Asia; seldom cultivated as a vegetable in many cvs.

**3053. *Solanum nigrum*** L., *S. vulgare* Kitt., *S. humile* Bernh. — Annual, subglabrous or sparsely downy, stems erect or ascendent, 10-70 cm high. **Seeds obovoid or reniform, lateral compressed with distinct or indistinct border, base narrowed, 1.9-2.3 x 1.5-1.7 mm. Surface fine reticulate-foveate, dull, yellow. 2n = 72.** Native to Europe, disturbed and cultivated grounds, gravelly places, river- and roadsides; in all Carpathian territories.

**3054. *Solanum pseudocapsicum*** L. — Annual to perennial, glabrous, stems erect, 20-120 cm high, ramified. **Seeds reniform to ellipsoid with distinct stronger border around, 3.8-4.1 x 3.1-3.3 mm. Surface reticulate-foveate, lustrous, whitish-yellow with darkish border. 2n = 24.** Native to North America, in lowland wet forests, coastal shrubberies; in the Carpathians rarely cultivated for its persistent and spectacular fruits in gardens, locally naturalized.

**3055. *Solanum rostratum*** Dunal, *S. cornutum* Lam., *S. heterandrum* Pursche — Annual, stems woody at base, erect, 30-60 cm high, richly ramified, densely felty and spiny. **Seeds obovoid to elliptic or globose, compressed, lateral sides flat, 2.6-3 x 2-2.3 mm. Surface reticulate-foveate, slight lustrous, dark-brown to black. 2n = 24.** Originally growing in North America; occasionally hauling into the Carpathians, in cultivated grounds and waste places. Mo, Sk, Uk.

**3056. *Solanum scabrum*** Mill., *S. guineense* (L.) Mill., *S. melanocerasum* All. — Annual, stems erect, shortly branched, 4-angular or winged, up to 100 cm high, glabrous, berries broadly ellipsoidal, lustrous, black. **Seeds obovoid, lateral compressed, radicle as long as the cotyledons, 2.1-2.6 x 1.5-1.8 mm. Surface reticulate-foveate, faint lustrous, ochreous. 2n = 72.** Native probably to tropical Africa, recently introduced into the Carpathians and experimentally cultivated for its edible fruits.

**3057. *Solanum sisymbriifolium*** Lam. — Annual, stellate downy, glandular, yellow, spiny. **Seeds subglo-**

**bosc to obovoid, compressed, lateral sides convex, 2.7-3 x 2.6-2.8 mm. Surface reticulate-foveate, dull, light ochreous. 2n = 24.** Originally growing in southern Africa; occasionally hauling into the Carpathians, waste places and field margins.

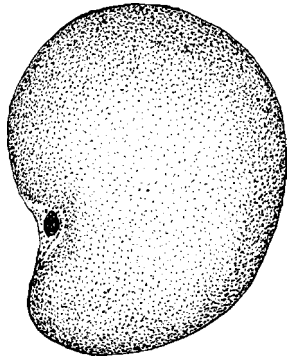
**3058. *Solanum sodomaeum*** L. — Perennial, scattered hirsute, densely prickly, stems erect, 50-300 cm high, much ramified. **Seeds reniform to subglobose, lateral compressed, hilum elliptic, 3-3.4 x 2.4-2.6 mm. Surface slight lustrous, reticulate-foveate, ochreous. 2n = 24.** Originally growing in south Africa, maritime sands, roadsides and waste places; into the Carpathians uniquely hauling with imported plant material.

**3059. *Solanum triflorum*** Nutt. — Annual, downy up to bare, hairs simple, stems ascendent, ramified, 20-100 cm. **Seeds obovoid or ellipsoid, flattish, apex blunt rounded, base narrowed, 1.8-2.2 x 1.2-1.4 mm. Surface slight reticulate-foveate, dull, yellowish-white up to dark-brown. 2n = 24.** Originally growing in North America, in prairies, as a weed in fields, gardens, pastures, sometimes cultivated in gardens as ornamental; in the Carpathians uniquely naturalized.

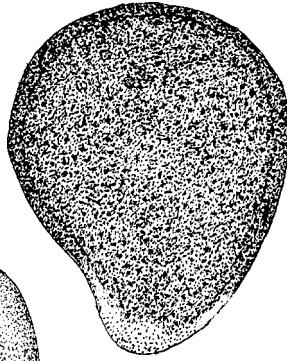
**3060. *Solanum tuberosum*** L., *Lycopersicon tuberosum* Mill. — Annual, stems erect or ascendent, 30-150 cm high, ramified, angular to winged above. **Seeds obovoid to ellipsoid, strong flattish, base narrowed with pale wing, 1.8-2.2 x 1.3-1.5 mm. Surface fine wrinkly, dull, yellowish-brown. 2n = 48.** Originally growing in South America, commonly cultivated as important food-stuffs and fodder (Potato), in garden and fields; throughout the Carpathians.

**3061. *Lycopersicon esculentum*** Mill., *Solanum lycopersicum* L. — Annual, lanately villous, glandular, aromatic, stems erect or ascendent, ramified. **Seeds ellipsoid to obovoid or reniform, lateral flattish with two hilums, 3.3-4 x 2.7-3.1 mm. Surface dense hairy, light-greyish. 2n = 24.** Originally growing in South America; commonly cultivated as a vegetable (Tomato), often naturalized on composts.

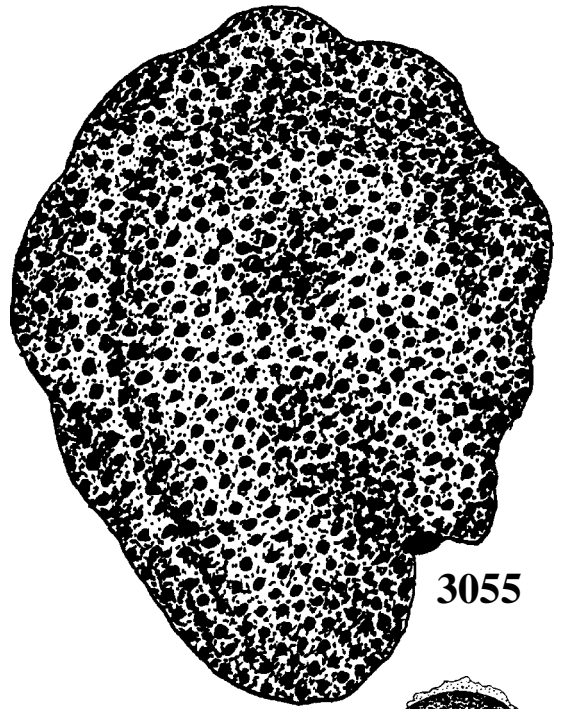
**3062. *Lycopersicon peruvianum*** (L.) Mill., *Solanum peruvianum* L. — Annual to perennial, stems feeble with straight short glandular hairy. **Seeds obovoid to ellipsoid with membranous wings at apex and base, 2.2-2.6 x 1.2-1.4 mm. Surface bare or with very short white hairs, shallow foveate, light brown.**



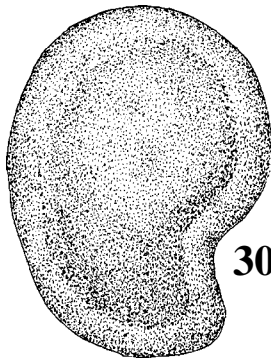
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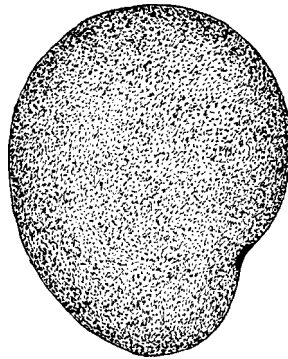
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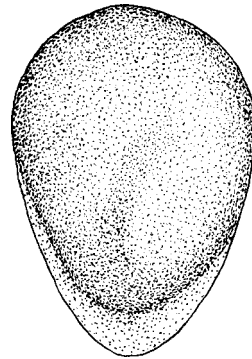
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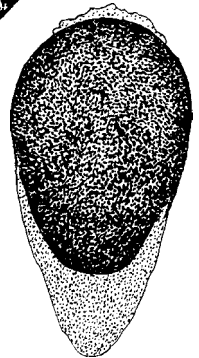
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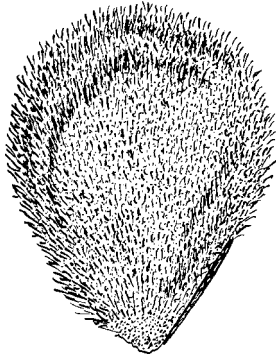
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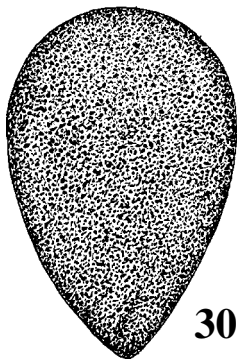
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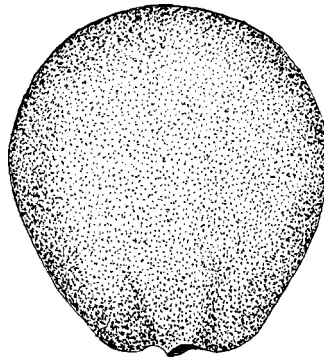
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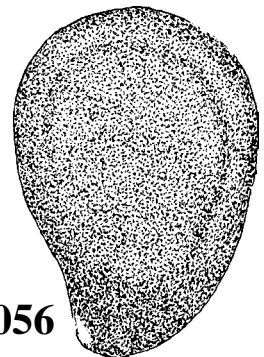
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Originally growing in South America (Peru, Chile), as a weed of fields; in the Carpathians rarely used as genetic material in tomato collection.

**3063. *Datura arborea* L.** — Shrub, up to 5 m high, stems erect, cylindric, ramified, verrucose, flowers white, up to 35 cm long. **Seeds irregular trigonous or rhomboidal, flattish, 8-11 x 6-8 mm. Surface irregular furrowed and tuberculate, dull, glabrous, ochreous or brown.** Originally growing in South America; cultivated in greenhouses, winter gardens and other flats, in summer as an ornamental in the open.

**3064. *Datura ferox* L.** — Annual, stems 50-150 cm high, usually glabrous, leaves broadly ovate, sinuate-dentate, corolla white. **Seeds reniform, lateral compressed, 3.5-4 x 4.2-4.8 mm. Surface fine reticulate-foveate with larger sockets, glabrous, brownish-black.** Native to eastern Asia; in the Carpathians rarely cultivated for ornament and locally naturalized.

**3065. *Datura innoxia* Mill.** — Annual, pubescent, stems 30-200 cm high, erect, ramified. **Seeds reniform, lateral compressed with furrow and rampart next to the seed border, 4.4-4.8 x 3.5-3.8 mm. Surface fine dotted, slight lustrous, ochreous. 2n = 24.** Originally growing in Central America; rarely hauling into the Carpathian waste places and depots in warmer areas.

**3066. *Datura metel* L.** — Annual, stems branched, 1-1.6 m high, bare, sparsely shortly hairy or glabrous. **Seeds reniform flattish with furrow and rampart on both sides, next to the seed border, 4.2-4.8 x 3.6-4 mm. Surface fine dotted, dull or slight lustrous, reddish-brown.** Originally growing in the Himalayas; in the Carpathians frequently cultivated for ornament in warmer areas.

**3067. *Datura stramonium* L., *Stramonium vulgare* Moench** — Annual, glabrous or downy, stems 50-100 cm high, ramified. **Seeds broad reniform to irregular globose, lateral compressed, 3-3.6 x 2.4-2.8 mm. Surface reticulate-foveate, dull, black. 2n = 24.** Originally growing in America; naturalized in disturbed grounds, fallows, waste places; in warmer areas of all Carpathian regions.

**3068. *Nicotiana alata* Link et Otto** — Perennial, sticky downy, stem 60-150 cm high. **Seeds obovate to ellipsoid, dorsal side blunt rounded, ventral ±**

**flat with prolonged hilum, 0.7-0.8 x 0.5-0.6 mm. Surface divided into small fieldlets, warty, slight lustrous, brown. 2n = 18.** Originally growing in South America; cultivated for ornament in gardens.

**3069. *Nicotiana glauca* R. C. Graham** — Shrub, up to 6-10 m high, glabrous, leaves glabrous, glaucous, elliptical to lanceolate, acute, flowers numerous, yellows. **Seeds angular, lateral compressed, 0.6-0.7 x 0.5-0.6 mm. Surface distinct veinous, slight lustrous, dark-brown. 2n = 24.** Native to Argentina and Bolivia; in the Carpathians scarce cultivated for ornament, rarely naturalized, on rocks, roadsides and walls, in warmer areas.

**3070. *Nicotiana rustica* L.** — Annual, stem 50-150 cm high, sticky-downy. **Seeds obovoid or ellipsoid, lateral slight narrowed with ascend hilum, 1-1.2 x 0.7-0.9 mm. Surface with border fieldlets, tuberculate, lustrous, dark-brown. 2n = 48.** Originally growing in central and South America; in the past cultivated for tobacco industry and locally naturalized.

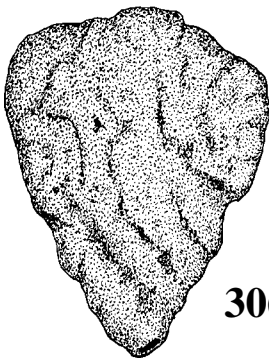
**3071. *Nicotiana suaveolens* Lehm.** — Perennial, sticky downy, stem 50-140 cm high. **Seeds trigonous to ellipsoid or rhomboid, ventral side often with prolonged hilum, 0.9-1 x 0.7-0.8 mm. Surface fine warty, dull, brown.** Native probably to Australia; often cultivated for ornament in gardens.

**3072. *Nicotiana tabacum* L., *N. latissima* Mill.** — Annual, sticky downy, stem erect, 1-3 m high, simple or poorly ramified. **Seeds obovoid or ellipsoid, lateral slight flattish, apex blunt rounded, base narrowed with hilum on one prolonged side, 0.6-0.8 x 0.4-0.6 mm. Surface reticulate, divided into fieldlets, tuberculate, slight lustrous, brown. 2n = 48.** Originally growing in South America; cultivated in many cvs for tobacco industry in the warmest part of the Carpathians.

**3073. *Petunia axillaris* (Lam.) Britt, *P. nyctagini-flora* A. L. Juss.** — Annual to perennial, stems 50-100 cm, branched at base, pubescent, glandular. **Seeds mostly globose, dorsal side rounded, ventral with ascend hilum, 0.6-0.7 x 0.5-0.6 mm. Surface reticulate, lustrous, brown.** Originally growing in South America; cultivated for ornament in gardens.

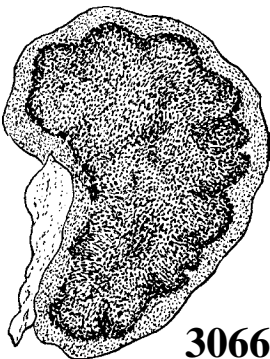
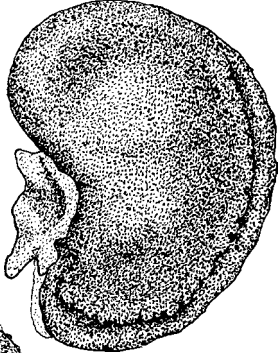
**3074. *Petunia parviflora* A. L. Juss., *P. vulgaris* Brandza** — Annual, stems 10-25 cm high, creeping, much ramified, shoots ascendent, glandular-hirsute. **Seeds ellipsoid to obovoid or spherical, ventral**



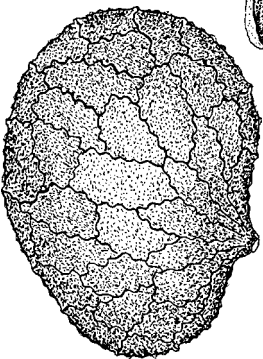


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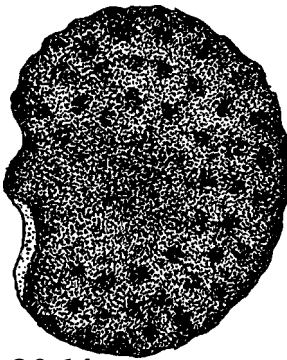
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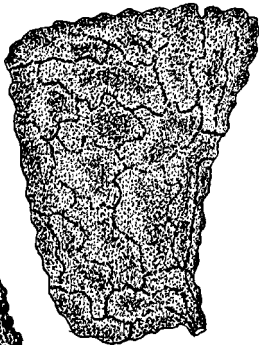
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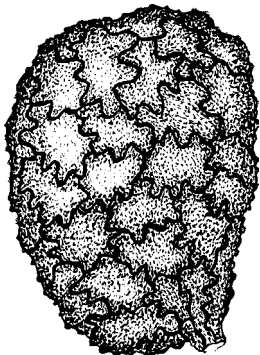
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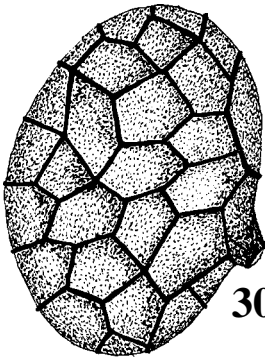
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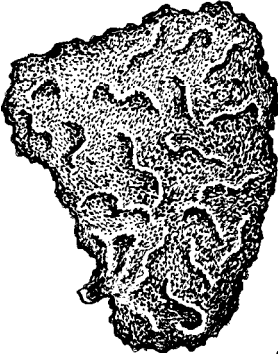
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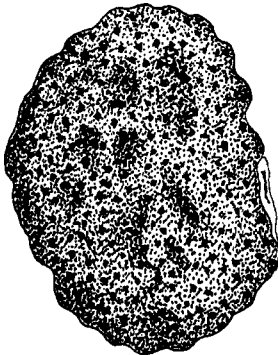
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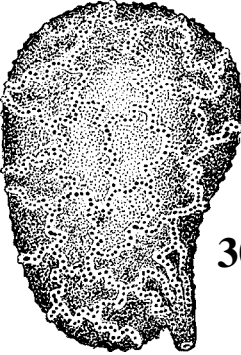
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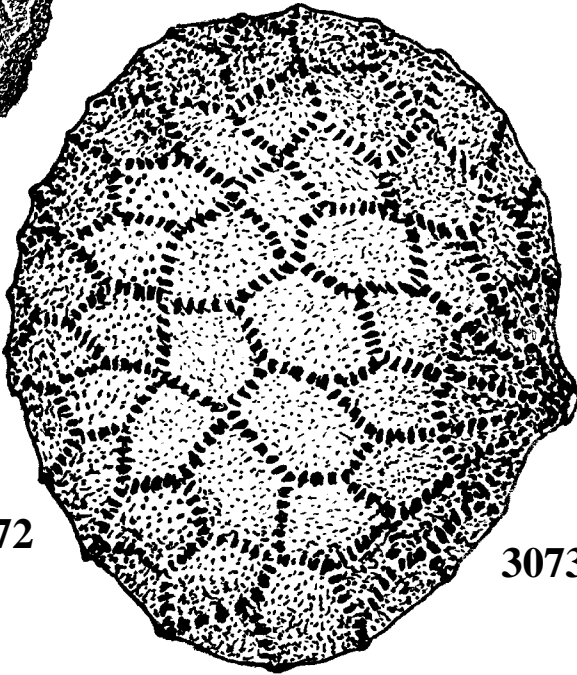
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side with prolonged hilum, 0.5-0.6 x 0.3-0.45 mm. Surface reticulate, divided into fieldlets, smooth, pale- to dark-brown. Originally growing in America, sandy grounds; rarely cultivated for ornament in gardens.

**3075. *Petunia violacea*** Lindl., *P. phoenicea* D. Don ex Loud. — Annual or perennial, stems ascendent, c. 1 m long, ramified above. **Seeds globose, obovoid or ellipsoid, dorsal side rounded, ventral flat with ascend hilum, 0.7-0.9 x 0.6-0.7 mm. Surface reticulate, divided into fieldlets, glabrous, lustrous, dark-brown.** Native to South America, cultivated for ornament in gardens.

**3076. *Petunia x atkinsiana*** D. Don, *P. hybrida* hort. — Annual, glandular-pubescent or hirsute, stems ramified, up to 50 cm high. **Seeds spherical, ellipsoidal, or rhomboidal, 0.6-0.8 x 0.5-0.7 mm. Surface reticulate, divided into fieldlets, lustrous, dark-brown. 2n = 14, 21, 28.** Garden hybrid *P. integrifolia* x *axillaris*, abundantly cultivated for ornament in many full-flowered and variously coloured cvs.

**3077. *Petunia x hybrida*** hort. — Annual, rich palette of cvs originated mostly from *P. violacea* Lindl. x *nyctaginiflora* Juss., or *axillaris* (Lam.) Britton, all coming from South America (Brasilia, Argentina). **Seeds ± globular, oval, ovoid, 0.7-0.8 x 0.6-0.7 mm. Surface reticulate-foveate, divided into fieldlets, lustrous, brown.** In the Carpathians cultivated in many cvs for ornament, in parks, gardens and balconies.

**3078. *Nicandra physaloides*** (L.) Gaertn., *Atropa physaloides* L., *Physalis peruviana* Mill. non L. — Annual, scattered hirsute below, glabrous above, stem erect, angular, 30-130 cm high, ramified. **Seeds globose to reniform, lateral flattish, hilum oval, 1.6-1.8 x 1.5-1.7 mm. Surface reticulate-foveate, lustrous, reddish-brown. 2n = 20.** Originally growing in South America; in the Carpathians sometimes cultivated for ornament in gardens.

**3079. *Salpiglossis sinuata*** Ruiz et Pav. — Annual, glandularly hirsute, stems erect, ramified. **Seeds semielliptic, apex truncate, base rounded with ascend hilum, 0.9-1.1 x 0.9-1 mm. Surface verrucose, dull, dark-brown. 2n = 44.** Originally growing in South America, sometimes cultivated in gardens as an ornamental, sporadically naturalized in waste places.

**3080. *Schizantus hybridus*** hort. — Annual to perennial, viscid-pubescent, 50-150 cm high, erect, much ramified. **Seeds reniform with irregular situated smaller or larger wing, slight compressed, 1.3-1.6 x 0.9-1.1 mm. Surface rough reticulate-foveate, slight lustrous, blackish-brown to black.** Originally spread from Chile; in the Carpathians widely cultivated for ornament, it may escape occasionally.

**3081. *Mandragora officinarum*** L., *M. vernalis* Bertol. — Perennial, acaulescent or with short stems, often with bifid, occasionally anthropomorphic fleshy tap-root, berry globose, yellow. **Seeds ellipsoid, lateral flattish, 6-7 x 5-5.9 mm. Surface dense reticulate-foveate, lustreless, slight orange to pale-brown.** Native to coasts of the central and eastern Mediterranean; in the Carpathians occasionally cultivated as an interesting plant.

#### 140. BUDDLEJACEAE

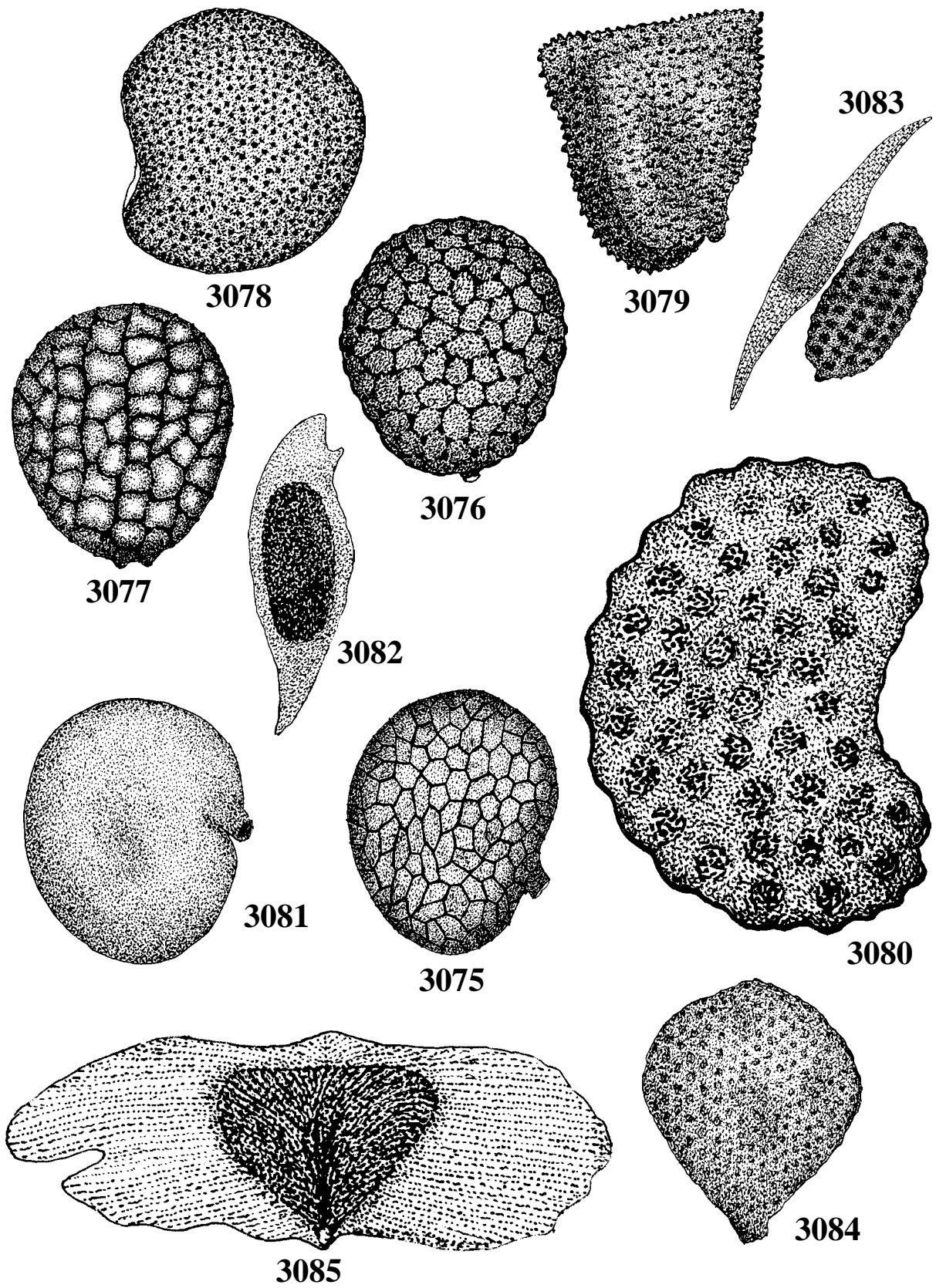
**3082. *Buddleja alternifolia*** Maxim. — Shrubs or small trees, up to 3 m high, with long archedly crooked twigs. **Seeds ellipsoid, with membranous hypanthium, 1.8-2.2 x 0.6-0.7 mm, own seeds size 1-1.1 x c. 0.5 mm. Surface reticulate-foveate, lustreless, greyish-brown.** Originally growing in China, the hardest and nicest species of *Buddleja*; in the Carpathians cultivated in parks and gardens in various cvs.

**3083. *Buddleja davidii*** Franch., *B. variabilis* Hemsl. — Shrub, up to 2-5 m high, with long archedly crooked twigs. **Seeds ellipsoid in oblong membranous reticulate, semitransparent hypanthium, narrowed at both ends, 2.8-4 x 0.3-0.5 mm. Surface slight lustrous. Own seed c. 0.7 x 0.35 mm. Surface rough reticulate-foveate, pale-brown. 2n = 76.** Native to China; in the Carpathians sporadically cultivated for ornament in parks and gardens.

**3084. *Buddleja globosa*** J. Hope — Shrub or tree, leaves opposite, flowers orange in long-pedunculate globose heads. **Seeds broad obovoid or angular, lateral compressed, 0.6-0.7 x 0.5-0.6 mm. Surface reticulate-foveate, glossy, light-brown.** Native to Chile and Peru; in the Carpathians rarely cultivated in parks.

#### 141. BIGNONIACEAE

**3085. *Campsis grandiflora*** Thunb., *Bignonia sinensis* Lam. — Woody liana, similar to *C. radicans*. **Seeds trigonous to ellipsoid, lateral compressed,**



base narrowed, ventral side with hilum, with papery sheath, 20-22 x 5-6 mm (with sheath), seeds size 7-7.6 x 2-2.2 mm. Surface fine furrowed and ribbed, lustrous, dark-brown, sheath light-brown. Originally growing in China, rarely cultivated near walls and chatter-houses.

**3086. *Campsis radicans*** (L.) Seem., *Bignonia radicans* L. — Woody liana, twigs up to 10 m high, leaves opposite, odd. **Seeds cordate up to globose, strong lateral compressed, with papery sheath, 12-18 x 5-7 mm (with sheath). Surface fine furrowed, lustrous, pale- or dark-brown, sheath light-brown.  $2n = 40$ .** Originally growing in North America, often cultivated as ornamental in parks and gardens, near walls or chatter-houses.

**3087. *Catalpa bignonioides*** Walt., *C. syringifolia* Sims — Shrub or tree, up to 20 m high, corona broad, leaves cordate, flowers white in denser clusters. **Double-seeds ellipsoid, dorsal side convex, ventral concave, papery sheath with fringes on both ends, 13-17 x 3-4 mm. Surface faint longitudinal furrowed, dull, greyish-brown.  $2n = 40$ .** Originally spread from North America; in the Carpathians often cultivated for ornament in parks and town verdure.

**3088. *Catalpa ovata*** G. Don fil., *C. kaempferi* Siebold et Zucc. — Shrub or tree, up to 10-15 m high, corona, wide, richly branched. **Double-seeds prolonged subellipsoid, dorsal side convex, ventral concave, papery sheath with fringes on both ends, 10-12 x 3.3-3.6 mm (without fringes). Surface faint longitudinal furrowed, dull, brown.** Originally growing in China; in the Carpathians rarely cultivated as ornamental in parks and town verdure.

**3089. *Catalpa speciosa*** Ward. — Tree, up to 20-30 m high, with pyramidal corona. **Double-seeds prolonged ellipsoid, dorsal side convex, ventral concave, papery sheath with fringes on both ends, 20-25 x 5-6 mm (without fringes). Surface fine longitudinal furrowed, dull, grey.** Native to North America, sometimes cultivated as a decorative species.

**3090. *Incarvillea olgae*** Rgl., *I. koopmanni* Lauche — Perennial, stems up to 1-1.5 m high, woody, bare at base, branched above. **Seeds oblong obovoid, horizontal strong compressed, dorsal side faint convex, ventral faint concave with longitudinal rib, transparent papery sheath around, sheath as broad**

**as a seed, 9.5-10.5 x 3.9-4.5 mm. Surface smooth, glabrous, faint lustrous, greyish-brown.** Native to central Asia, on sand deposits and stony slopes; in the Carpathians very rarely cultivated as an ornamental in parks.

#### 142. ACANTHACEAE

**3091. *Acanthus balcanicus*** Heywood et I. B. K. Richardson, *A. longifolius* Host non Poir. — Perennial, robust herb or shrub, stem simple, terete, erect, 50-200 cm high, basal leaves usually pinnatisect. **Seeds broad oval, lateral compressed, ventral side humped, with hilum, 8-10 x 7-8 mm. Surface smooth or wrinkly, lustrous, reddish-brown.** Native to the Balkan Peninsula, woods, scrubs and stony hill sides. Ro.

**3092. *Acanthus mollis*** L. — Perennial, stems 25-200 cm high, leaves glabrous to puberulent. **Seeds broad oval, lateral flattish, dorsal side convex, ventral flat, often with two longitudinal furrows, hilum on lateral side, 9-12 x 7.5-9 mm. Surface slight wrinkly and lustrous, reddish-brown.  $2n = 56$ .** Native to the Balkan Peninsula, shady places and roadsides; in the Carpathians rarely cultivated for ornament in gardens.

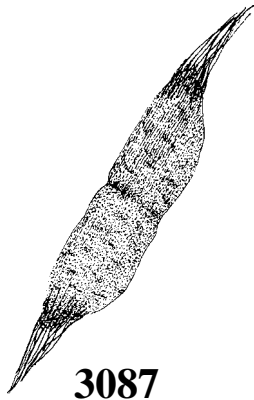
**3093. *Thunbergia alata*** Boj. ex Sims — Annual, trailing, fast-growing climber plant. **Seeds globular, dorsal side convex, ventral flat or concave, with deep socket, 4.2-4.8 x 3.7-4.3 mm. Surface rough, semireticulate, dull, dark-brown.** Native to subtropical Asia and Africa; rarely cultivated as covering liana for walls, balconies and chatter-houses.

#### 143. GESNERIACEAE

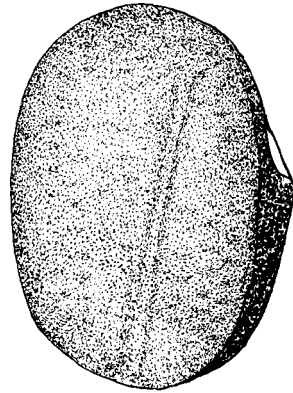
**3094. *Saintpaulia ionantha*** H. Wendl. — Perennial, low plant with rounded, pulpy, roughly downy leaves rosette, flowering stems 5-10 cm high, with 5-10 flowers. **Seeds ellipsoid, convexo-convex, dorsal side with broad and deep longitudinal furrow and white hilum, 0.4-0.5 x 0.2-0.3 mm. Surface longitudinal waved, lustreless, dark-brown.** Native to eastern Africa; in the Carpathians often cultivated in flowerpots in some cvs as a room or window ornamental plant.

#### 144. SCROPHULARIACEAE

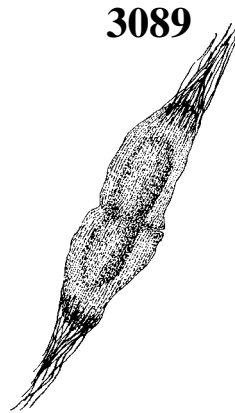
**3095. *Paulownia tomentosa*** (Thunb.) Steud., *P. imperialis* Siebold et Zucc. — Tree, with divergent, first hairy later on smooth twigs, up to 10-20 m high.



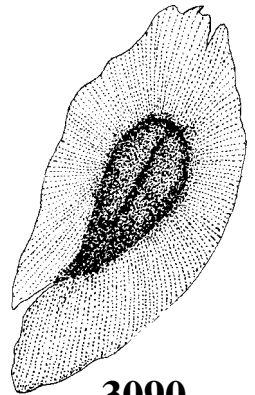
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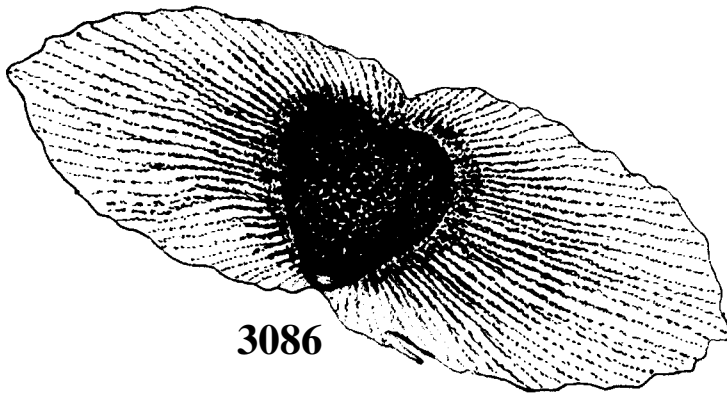
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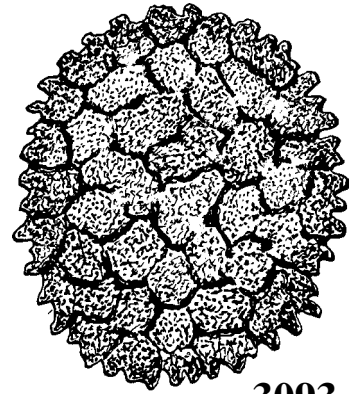
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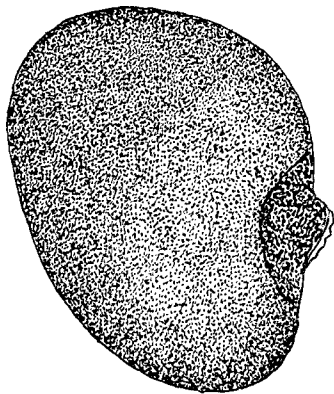
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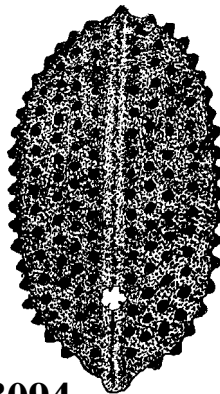
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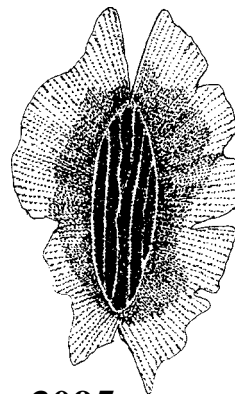
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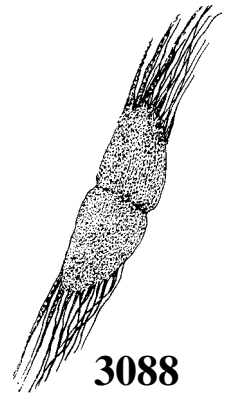
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Seeds ellipsoid, winged around the whole edge, with white semi- or transparent membrane, 4-4.5 x 2.5-2.9 mm. Surface with longitudinal ribs, brown, the wing lustrous.  $2n = 34, 40$ . Originally growing in Japan; in the Carpathians often cultivated as an attractive ornamental tree in parks and towns, in warmer areas.

**3096. *Verbascum abietinum*** Borbás, *V. vernale* Wierzb. — Perennial (biennial), stems 50-120 m high, ramified, tomentose, with suberect or ascending branches. Seeds ellipsoid to obovoid, apex truncate, base narrowed with distinct hilum, 0.9-1.1 x 0.6-0.8 mm. Surface longitudinal and horizontal ribbed-furrowed, dull, dark-brown. Native to the Balkan mountains; in woody, mountain and subalpine areas. Ro.

**3097. *Verbascum austriacum*** Schott ex Roemer et Schultes, *V. orientale* Čelak. non M. Bieb., *V. chaixii* Vill. — Perennial, stems 50-100 cm high, basal leaves not lobbed, green beneath, upper cauline leaves finely crenulate-serrate. Seeds obovate, apex truncate, horizontal section  $\pm$  rounded, bottom lateral narrowed, 0.8-1 x 0.5-0.6 mm. Surface longitudinal shallow furrowed, horizontal pitted deeply, dull, brown.  $2n = 26, 32, 36$ . Native to Europe, on sunny, stony and bushy slopes, at wood margins, fallows, on river gravels. Hu, Mo, Pl, Ro, Sk, Uk.

**3098. *Verbascum banaticum*** Roch. — Biennial, stem 50-100 cm high, cylindric, leafy to prismatic. Seeds ellipsoid, obovoid, apex truncate, base slight rounded with hilum, 0.6-0.8 x 0.4-0.5 mm. Surface sparse tomentose or glabrous, ribbed-furrowed, dull, dark-brown. Native to the Balkan Peninsula, coastal sands, waste places, shrubby forests, sandbanks. Ro, Uk.

**3099. *Verbascum blattaria*** L. — Biennial (annual), glabrous below, glandular above, stems erect, unbranched, 30-120 cm high. Seeds obovate, rhombic, apex truncate, base rounded with short hilum, 0.7-0.9 x 0.5-0.6 mm. Surface ribbed-furrowed, dull, dark-brown.  $2n = 30$ . Native to Eurasia, usually in rather damp places, roadsides, sand-dunes, saline grounds; in all Carpathian regions.

**3100. *Verbascum densiflorum*** Bertol., *V. thapsiforme* Schrad. — Biennial, stems 50-120 cm high, erect, leafy, unbranched, winged. Seeds obovate to elliptic with longitudinal furrow on ventral side, apex truncate, base rounded with sunken hilum,

0.8-1 x 0.6-0.8 mm. Surface ribbed-furrowed, dull, dark-brown.  $2n = 32, 36$ . Native to Europe, sunny, stony, dry slopes, overgrown rocks, embankments, waste places; throughout the Carpathians.

**3101. *Verbascum lanatum*** Schrad. — Perennial or biennial, stems 50-120 cm high, erect, leafy, densely lanate, usually simple. Seeds ovoid or ellipsoid, apex blunt rounded, base narrowed with hilum, 0.9-1.1 x 0.6-0.8 mm. Surface furrowed-ribbed, dull, smooth, dark-brown. Native to southern Europe, chiefly in mountain woods, at altitudes of up to 2000 m. Hu, Mo, Ro, Uk.

**3102. *Verbascum lychnitis*** L. — Biennial, scattered lanate, stems erect, 50-150 cm high, glandular above. Seeds obovoid to ellipsoid or prismatic, apex truncate, base mostly rounded, 0.7-0.9 x 0.5-0.6 mm. Surface furrowed and ribbed, dull, dark-brown.  $2n = 26, 32, 34$ . Native to Eurasia, light and warm places, limestone rocks, river and brook margins; in all Carpathian regions.

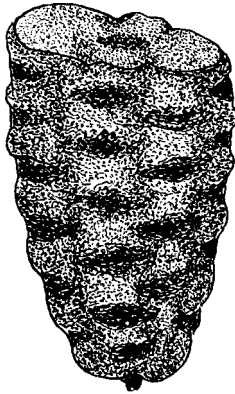
**3103. *Verbascum nigrum*** L. — Perennial, pubescent to lanate, stems erect, 50-100 cm high, sharply angular above. Seeds ellipsoid, ovoid or prismatic, apex truncate, base mostly rounded, hilum indistinct, 0.8-1 x 0.5-0.7 mm. Surface furrowed-ribbed, dull, dark-brown.  $2n = 30, 34$ . Native to Eurasia, waste lands, along paths, roadside verges, embankments, clearings in all Carpathian territories.

**3104. *Verbascum olympicum*** Boiss — Perennial, stems 150-200 cm high, plant densely tomentose, with large rosette of leaves. Seeds cylindric, apex truncate, bottom roundish, 0.9-1.1 x 0.5-0.7 mm. Surface longitudinal and transversal furrowed, lustreless, dark-brown. Native to Asia Minor; in the Carpathians cultivated for ornament in gardens.

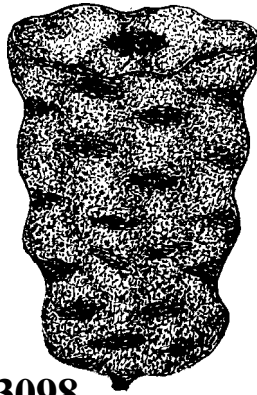
**3105. *Verbascum phlomoides*** L., *V. regulosum* Willd. — Biennial, felty, stem erect, 50-150 cm high, unramified. Seeds obovate-turbinate or polyhedral, apex truncate, base faint rounded with short hilum, 0.6-0.8 x 0.4-0.6 mm. Surface furrowed-ribbed, dull, brown.  $2n = 32$ . Native to Europe, waste places, roadsides, open woodlands, fallows, sunny and stony slopes in all Carpathian regions.

**3106. *Verbascum phoeniceum*** L. — Perennial (annual), stem erect, 30-100 cm high, crispate villous below, glandular-pubescent above. Seeds oval, ellipsoid, apex truncate, base rounded with short

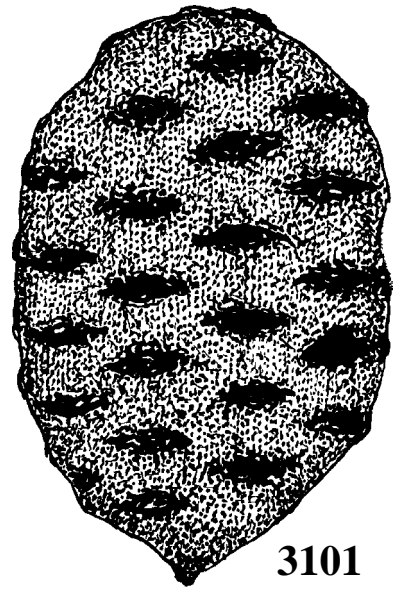
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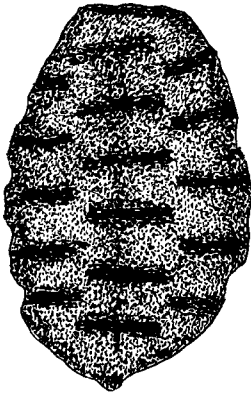
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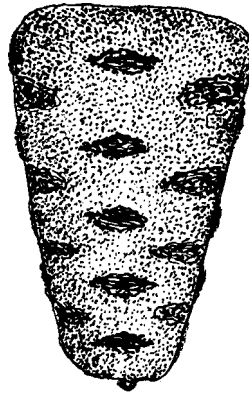
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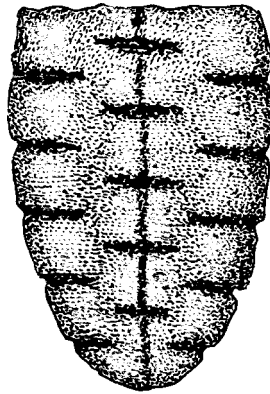
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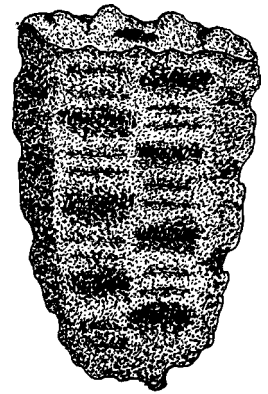
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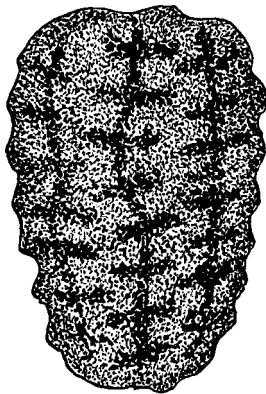
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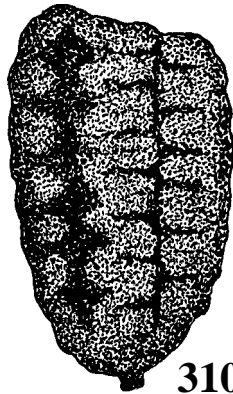
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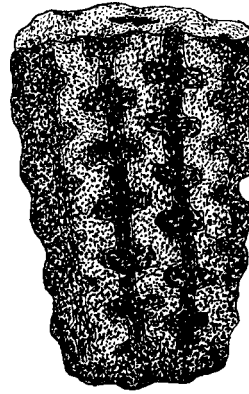
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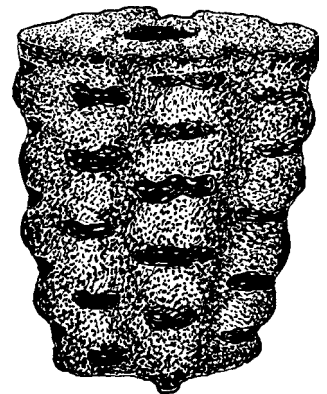
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3102



3106



**hilum, 0.6-0.8 x 0.5-0.7 mm. Surface furrowed and ribbed, dull, dark-brown.  $2n = 22, 36$ .** Native to Eurasia, dryer meadows and pastures, light woodlands and shrubberies, rocky slopes. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**3107. *Verbascum pulverulentum* Vill., *V. floccosum* Waldst. et Kit.** — Biennial, stem 50-120 cm high, cylindric, erect, ramified. **Seeds ellipsoid, obovoid, cylindric, apex truncate, base slight narrowed with hilum, 0.8-1 x 0.5-0.7 mm. Surface ribbed-furrowed, dull, dark-brown.** Native to western, central and southern Europe, sunny hill slopes, dry meadows, sandy and stony grounds. Hu, Ro.

**3108. *Verbascum sinuatum* L., *V. undulatum* M. Bieb.** — Biennial, stems, 50-100 cm high, leafy, branched from the base, twigs thin, crooked. **Seeds ellipsoid, apex truncate, base rounded with hilum, 1-1.2 x 0.7-0.8 mm. Surface ribbed-furrowed, dull, grey or greyish-brown.** Native to the Mediterranean, eastern Europe and Asia Minor, fields, fallows, gravel and saline grounds. Uk.

**3109. *Verbascum speciosum* Schrad., *V. longifolium* DC.** — Annual, robust, ramified, stems adpressed felted, 100-200 cm high, erect. **Seeds ellipsoid-prismatic, apex truncate, base slight rounded with hilum, 0.8-1.1 x 0.6-0.7 mm. Surface ribbed-furrowed, dull, dark-brown.  $2n = 28$ .** Native to Eurasia, sunny shrubby slopes, forest margins; often cultivated for ornament in gardens. Hu, Mo, Ro, Sk, Uk.

**3110. *Verbascum thapsus* L.** — Biennial, more or less densely greyish- or whitish-tomentose, 30-200 cm high. **Seeds obovoid-turbinate, apex truncate, base rounded with small hilum, 0.8-1 x 0.5-0.6 mm. Surface furrowed and ribbed, dull, dark-brown.  $2n = 36$ .** Native to Eurasia, weedy places, along roadsides, embankments and waste lands, clearings and woodland edges. Hu, Mo, Pl, Ro, Sk, Uk.

**3111. *Gratiola officinalis* L.** — Perennial, stem erect or ascendent, 10-50 cm high, hollow, 4-angular, simple or little ramified, glabrous. **Seeds prolonged ellipsoid, trigonous, straight, sometimes crooked, dorsal side convex, ventral flat, apex truncate, base narrowed, 0.6-0.8 x 0.2-0.3 mm. Surface reticulate, smooth, lustrous, light-brown.  $2n = 32$ .** Native to Eurasia, streamsides, irrigation channels, marshy grounds, mostly in lowlands; in all Carpathian regions.

**3112. *Lindernia procumbens* (Krock.) Borbás, *L. pyxidaria* L. p.p.** — Annual, glabrous, 5.6-20 cm high, stems erect, procumbent to ascending, 4-angular, branched at base. **Seeds prolonged ellipsoid, apex rounded or truncate, base rounded with short hilum, 0.3-0.4 x 0.1-0.2 mm. Surface longitudinal verruculose, lustrous, yellow.  $2n = 32$ .** Native to Eurasia, wet, muddy or sandy places, marshy meadows of warm areas. Hu, Pl, Ro, Sk, Uk.

**3113. *Limosella aquatica* L.** — Annual, tiny, glabrous, without stems, leaves in basal rosette, sometimes perennality secured by stolons. **Seeds ellipsoid, apex rounded with small beak, base rounded with hilum, 0.5-0.7 x 0.2-0.4 mm. Surface reticulate, lustrous, light-brown.  $2n = 40$ .** Native to Eurasia, ditches, lake-shores and places subject to periodical flooding; nearly throughout the Carpathian regions.

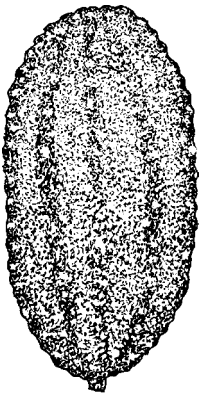
**3114. *Mimulus guttatus* DC., *M. luteus* auct. non L.** — Perennial, glabrous, inflorescence glandularly downy, stem 15-50 cm high, ascending to erect, ramified. **Seeds ellipsoid, apex truncate with small beak, base narrowed with hilum, 0.5-0.7 x 0.2-0.4 mm. Surface in longitudinal ribs tuberculate, lustrous, brown.  $2n = 16, 28, 30, 32, 48$ .** Originally growing in North America; an ornament plant cultivated in gardens and naturalized along streams over a large part of the Carpathians. Br, Pl, Ro, Sk, Uk.

**3115. *Mimulus luteus* L.** — Perennial or annual, stems 30-50 cm high, erect, leaves ovoid, bare, flowers large, yellow with red spots. **Seeds ellipsoid, lateral slight compressed, 0.6-0.8 x 0.35-0.45 mm. Surface longitudinal furrowed and ribbed, slight lustrous, dark-brown.** Native to America, a swampy plant, in moisty calcareous, peaty localities, often naturalized along the brooks; very rarely cultivated in the Carpathians.

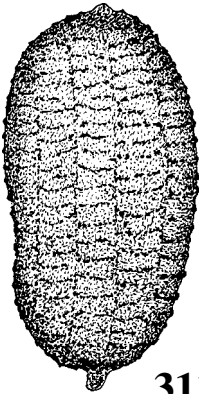
**3116. *Mimulus moschatus* Dougl. ex Lindl.** — Perennial, glandular, whole plant viscid-pubescent, stem procumbent to ascendent, up to 35 cm high. **Seeds spherical, apex blunt rounded with small beak, base rounded with hilum, 0.3-0.4 x 0.2-0.3 mm. Surface wrinkly, lustrous, brown.  $2n = 32$ .** Native to North America, cultivated for ornament in gardens, rarely naturalized in damp or shady places. Ro, Sk.

**3117. *Calceolaria polyrhiza* Cav.** — Perennial, stem ascending, leaves opposite, lanceolate, acute. **Seeds ellipsoid, slight flattish, transversal section**

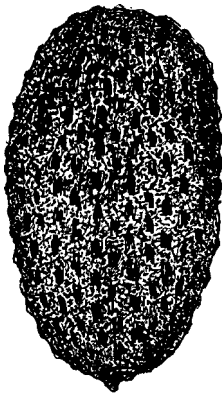




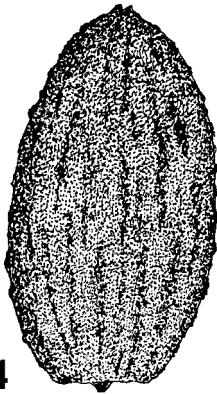
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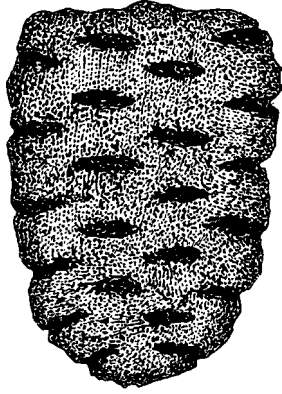
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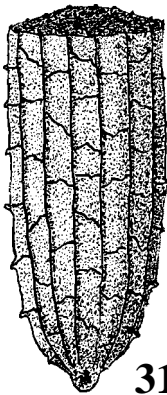
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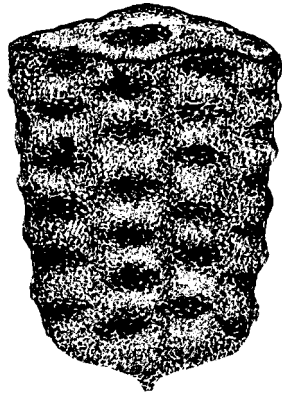
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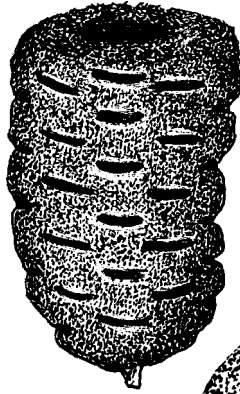
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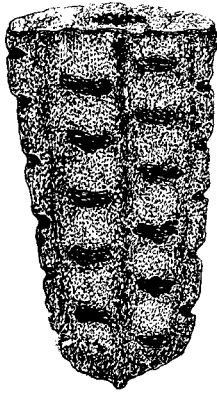
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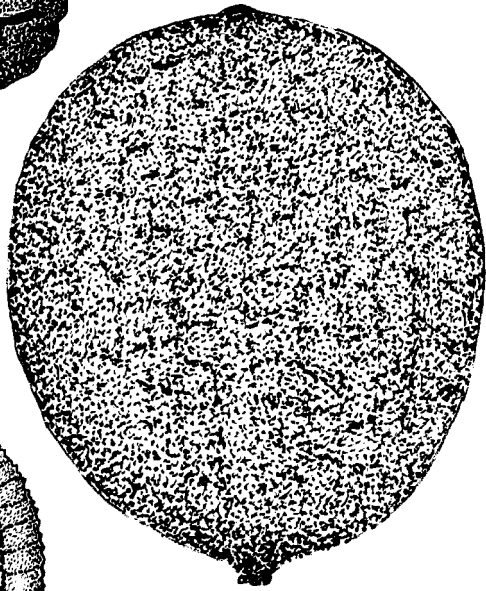
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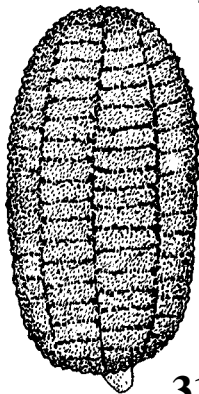
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oval, apex rounded, base with small hilum, 0.8-1 x 0.4-0.5 mm. Surface longitudinal shallow furrowed, lustrous, reddish-brown.  $2n = 26$ . Originally growing in southern China, in the past often cultivated for ornament (not withstanding winter) in many hybrids (*C. hybrida* hort.), with attractive flowers.

**3118. *Collinsia bicolor*** Benth. — Annual, stem erect, ramified. Seeds ellipsoid, dorsal side convex, ventral concave, 1.8-2.2 x 1.5-1.7 mm. Surface reticulate on dorsal side, deep concave and smooth on ventral side, dull, violet-brown.  $2n = 14$ . Originally growing in North America, rarely cultivated for ornament in gardens.

**3119. *Penstemon barbatus*** (Cav.) Nutt. — Perennial, stems 100-150 cm high, leaves long and narrow, stems with numerous flowers, of light-red to salmon-pink colour. Seeds of irregular shape, mostly angular, often opaque winged on apex or lateral sides, 1.9-2.4 x 1.3-1.5 mm. Surface reticulate, dull or faint lustrous, pale- or dark-brown. Native to America (Mexico, Colorado); in the Carpathians seldom cultivated in pure forms, mostly as hybrids with other *Penstemon* species.

**3120. *Penstemon menziesii*** Hook. — Perennial, stems erect, ramified with rich cluster of the flowers. Seeds with wide scale of shapes, mostly angular, angles with membranous hem, 1.2-1.8 x 1-1.2 mm. Surface granulate, dull, glabrous, brown to dark-brown, usually yellowish-brown.  $2n = 16$ . Originally growing in North America, often cultivated as a permanent plant in gardens.

**3121. *Scrophularia canina*** L. — Perennial or small shrub, glabrous, stems 20-60 cm high, usually sparingly branched, cymes 5-25-flowered, forming a cylindric panicle. Seeds rectangle, concavo-convex, lateral flattish and deflexed, 2-2.4 x 1.2-1.4 mm. Surface brickbuilt, slight lustrous, dark-purplish.  $2n = 24, 26$ . Native to Eurasia, in waste places and sunny stony grounds of the lowland zone. Sk (?).

**3122. *Scrophularia heterophylla*** Willd., *S. laciniata* Waldst. et Kit. — Perennial, glabrous or glandular, rarely puberulent, often glaucous, stems 10-70 cm high, usually numerous. Seeds ellipsoid, longitudinal and transversal furrowed, 0.8-0.9 x 0.55-0.65 mm. Surface bumpy, slight lustrous, dark-brown.  $2n = 24$ . Native to southern Greece and the

Balkan Peninsula; rocky slopes, calcareous grounds of montane and alpine zones. Ro.

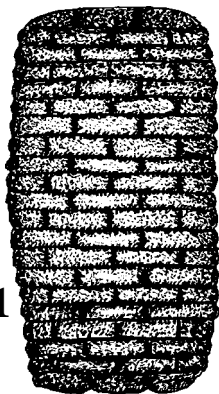
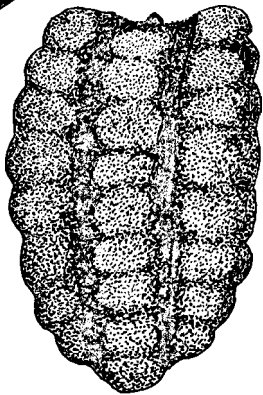
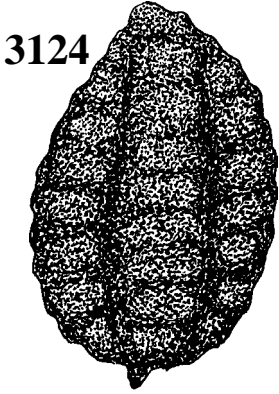
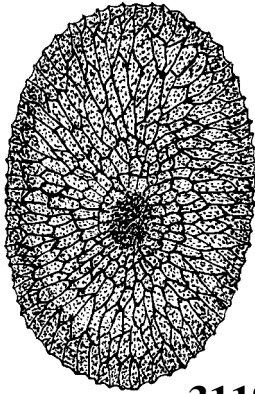
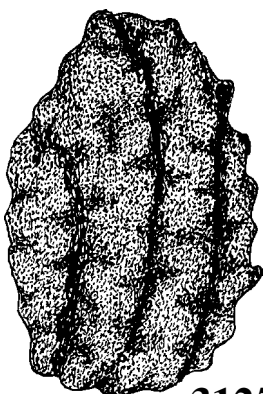
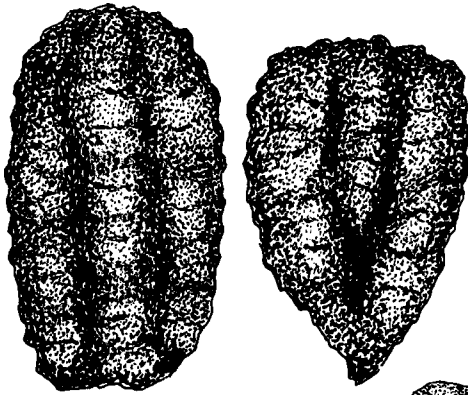
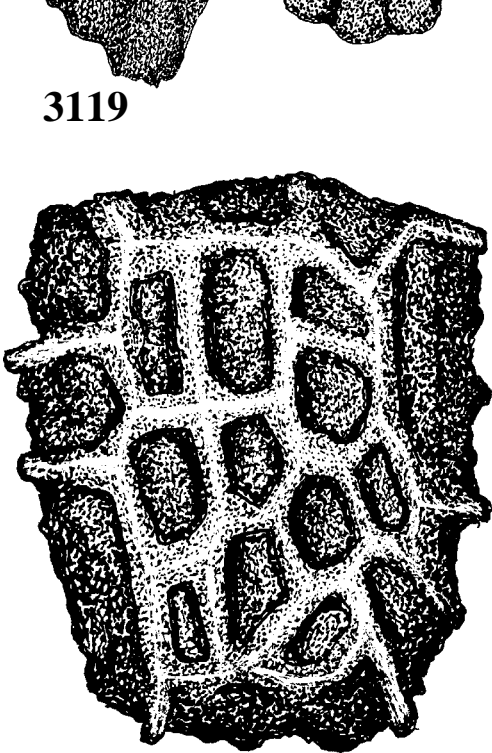
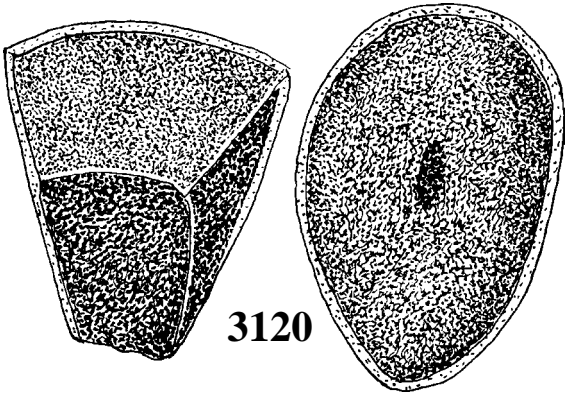
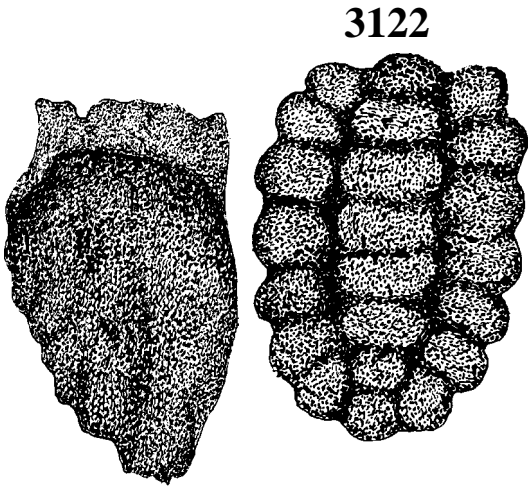
**3123. *Scrophularia nodosa*** L. — Perennial, glabrous, stems erect, 30-100 cm high, 4-angular, unramified, sometimes narrowly winged. Seeds ellipsoid, obovoid, rounded at the ends, truncate or narrowed, 0.7-0.9 x 0.4-0.6 mm. Surface rugose, longitudinal furrowed with transversal arranged depressions, slight lustrous, blackish-brown.  $2n = 36$ . Native to Eurasia, in woodlands, clearings, ditches, along riverbanks, an old medical plant; in all Carpathian regions.

**3124. *Scrophularia scopoli*** Hoppe, *S. glandulosa* Waldst. et Kit. — Perennial, downy, stem erect, 30-100 cm high, 4-angular, unwinged, glandular above. Seeds ovoid to ellipsoid, apex rounded, base truncate with hilum, 0.6-0.9 x 0.4-0.6 mm. Surface rugose, longitudinal and transversal furrowed, dull, blackish-brown.  $2n = 26$ . Native to Eurasia, in woods, damp and rocky slopes, stream-sides, scrubs, mainly in mountains; throughout the Carpathians.

**3125. *Scrophularia umbrosa*** Dumort., *S. alata* Gilib., *S. aquatica* L. — Perennial, glabrous, stems erect, broadly winged, 40-150 cm high, 4-angular, branched above. Seeds ovoid to ellipsoid with longitudinal furrows and waved ribs, 0.6-0.7 x 0.4-0.5 mm. Surface rugose, slight lustrous, brown. Native to Eurasia, coniferous and mixed forests, damp meadows, boundaries, shrubberies, from lowlands to mountains; throughout the Carpathians.

**3126. *Scrophularia vernalis*** L. — Perennial (biennial), stem erect, 20-80 cm high, 4-angular, glandularly downy. Seeds ovoid to ellipsoid, apex truncate, base narrowed, 0.8-1.1 x 0.6-0.7 mm. Surface rugose with distinct waved ribs, glabrous, dull, dark-brown.  $2n = 40$ . Native to Europe, moist mountain woods, damp waste, shady places, shrubberies, from lowland up to subalpine zones. Hu, Mo, Pl, Ro, Sk, Uk.

**3127. *Antirrhinum majus*** L., *Orontium majus* Pers. — Perennial, stems erect, 50-120 cm high, bare below, glandularly pubescent above. Seeds rhomboid, 0.9-1.1 x 0.7-0.9 mm. Surface crested and lattice ribbed, coarse reticulate-foveate, dull, dark-brown.  $2n = 16$ . Native to southwestern Europe; commonly grown for ornament in numerous cultivars in gardens and often naturalized.



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**3128. *Misopates orontium* (L.) Raf., *Antirrhinum orontium* L.** — Annual, stem erect, 20-50 cm high, ramified, glabrous to sparse hairy below, glandular-pubescent above. **Seeds rhomboid to obovoid, dorsal side convex with longitudinal ribs, ventral side flat, concave with rounded border and blackish wing around the seed, 0.9-1.2 x 0.7-0.9 mm. Surface reticulate, dull, dark-brown. 2n = 12.** Native to the Mediterranean, stony granite screes, often grown in rock-gardens. Hu, Pl, Ro, Sk, Uk.

**3129. *Microrrhinum minus* (L.) Fourr., *Antirrhinum minus* L., *Linaria minor* (L.) Desf.** — Annual, glandularly pubescent, stems erect, ramified, 5-40 cm. **Seeds obovoid to ellipsoid, with 5-8 longitudinal smooth or sinuate ribs, apex truncate, base rounded with oval hilum, 0.7-0.8 x 0.4-0.5 mm. Ribbed surface waved, dull, whitish, pale- to dark-brown. 2n = 14.** Native to Eurasia, cultivated fields, waste places, railway-lines, stony slopes, fallows; in all Carpathian territories.

**3130. *Linaria alpina* (L.) Mill.** — Perennial, glabrous, stems procumbent, ends ascendent, 5-50 cm high, ramified. **Seeds suborbicular, flattish, disc slight convex on both sides, broad winged, 1.9-2.2 x 1.6-1.8 mm. Surface smooth, reticulate, rare pustulate, slight lustrous, black. 2n = 12.** Native to Europe, stony granite screes, rocky slopes and river gravels; in mountains of the Alps and Carpathians. Ro, Sk.

**3131. *Linaria angustissima* (Loisel.) Borbás, *L. italica* Trev.** — Perennial, stem erect, 15-45 cm high, upper part richly ramified. **Seeds spherical, obovoid, seed disc convex on both sides, with broad membranous wing, 2-2.4 x 1.5-1.9 mm. Surface dense pustulate, slight lustrous or dull, black, wing paler. 2n = 12.** Native to southern Europe, karst rocky and stony steppes, roadsides. Hu, Ro, Sk, Uk.

**3132. *Linaria arvensis* (L.) Desf., *Antirrhinum arvense* L.** — Annual, glabrous, stem erect, 10-50 cm high. **Seeds mostly spherical, disc convex on both sides, lateral compressed, winged, 1.5-1.9 x 1.5-1.9 mm. Surface of the disc smooth or pustulate, glossy, dark-greyish. 2n = 12.** Native to Europe, cultivated grounds and other habitats, especially sandy soils. Hu, Pl, Ro, Sk.

**3133. *Linaria biebersteinii* Bess., *L. strictissima* Schur** — Perennial, stems 30-55 cm high, erect, simple, rarely ramified, upper part hirsute. **Seeds ellipsoid**

**disc convex on both sides, flattish, with membranous wing, 2.5-2.9 x 1.8-2.2 mm. Surface pustulate, lustrous, black, wing shallow reticulate.** Native to southeastern European steppes. Mo, Ro, Sk, Uk.

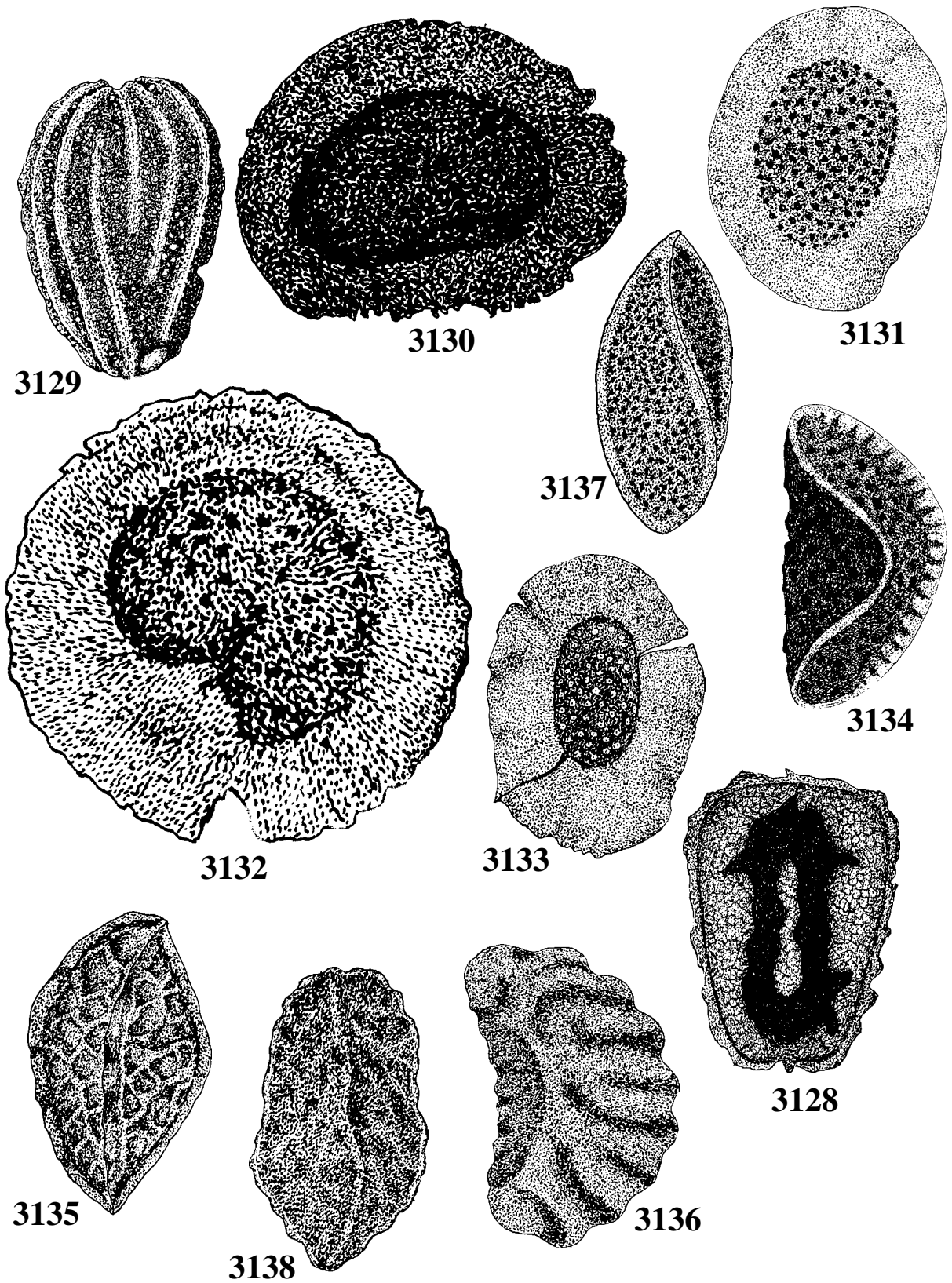
**3134. *Linaria dalmatica* (L.) Mill., *L. grandiflora* Desf., *Antirrhinum dalmaticum* L.** — Perennial, stem 60-90 cm high, glabrous, erect or ascendent, ramified. **Seeds rhombic, trigonous with narrow wing at angle, 1.4-1.7 x 0.7-0.9 mm. Surface pustulate, dull or slight lustrous, black, wing reticulate. 2n = 12.** Native to southeastern Europe, sunny rocky slopes, light forests and shrubberies, steppes, lowlands up to mountains. Ro.

**3135. *Linaria genistifolia* (L.) Mill., *Antirrhinum genistifolium* L.** — Perennial, glabrous, greyish-green, stem erect, 30-100 cm high, ramified. **Seeds rhombic, tetrahedral, trigonous, angles often narrow winged, 0.8-1 x 0.5-0.6 mm. Surface pustulate, lustrous, black. 2n = 12.** Native to eastern Europe, sunny, stony and shrubby slopes, forests, steppes on sandy grounds, roadsides; in all Carpathian territories.

**3136. *Linaria incarnata* (Vent.) Sprengel, *L. bipartita* auct. non (Vent.) Willd.** — Annual, glabrous or glandular-pubescent in inflorescence, stem 15-60 cm high, erect. **Seeds reniform, dorsal side convex, deep transversal waved, 0.7-0.8 x 0.5-0.6 mm. Surface pustulate, slight lustrous, dark-grey to black.** Originally introduced from Africa, dry grasslands and cultivated fields; in the Carpathians rarely cultivated for ornament in gardens, locally naturalized.

**3137. *Linaria purpurea* (L.) Mill.** — Perennial, glabrous, stem ascendent up to erect, 20-60 cm high, branched above. **Seeds multi-shaped with narrow wing-like angles, 1.8-2.1 x 0.6-0.8 mm. Surface rugose-pustulate, dull, black. 2n = 12.** Native to southern Europe; sometimes grown for ornament in gardens, uniquely naturalized.

**3138. *Linaria repens* (L.) Mill., *L. striata* DC., *L. monspessulana* (L.) Mill.** — Perennial, glabrous, stems erect, 20-120 cm high, ramified above. **Seeds ovoid-trigonous with acute, narrow, wing-like angles, 1.3-1.5 x 0.7-0.9 mm. Surface strong rugose, dull, black. 2n = 12.** Native to southwestern Europe, hauling into fallows, waysides and waste places. Pl.



**3139. *Linaria vulgaris*** Mill., *Antirrhinum linaria* L. — Perennial, glabrous or glandular-hairy above, stems erect, 20-60 cm high, simple or ramified at base. **Seeds spherical with broad membranous wing, strong compressed, 2-2.5 x 1.7-2 mm. Surface pustulate, slight lustrous, greyish-black to black, wing reticulate. 2n = 12.** Native to Eurasia, disturbed meadows, riverbanks, rocks, waste places, fields, fallows, boundaries; in all Carpathian territories.

**3140. *Cymbalaria muralis*** Gaertn. Meyer et Schreb., *Linaria cymbalaria* (L.) Mill. — Annual or perennial, stems procumbent or pendulous from walls and rocks, 10-60 cm long. **Seeds broad ellipsoid or globose, various alveolate with ridge or wing, 1-1.3 x 0.8-1 mm. Surface ornate with high acute ridges and a few tubercles, dull, dark-brown to black. 2n = 14.** Native to southern Europe; often cultivated in rock-gardens and naturalized on shady rocks and walls; throughout the Carpathians.

**3141. *Cymbalaria pallida*** (Ten.) Wettst. — Perennial, stems creeping or pendulous, 5-25 cm long, usually puberulent to pubescent, rarely glabrous. **Seeds ovoid to ellipsoid with roundish, longitudinal ridges of various size, 1.3-1.6 x 1.1-1.3 mm. Surface tuberculate, dull, black. 2n = 14.** Native to southern Europe (Italy), rocks and screes; rarely cultivated in rock-gardens and uniquely naturalized. Sk.

**3142. *Kickxia elatine*** (L.) Dumort., *Elatinoides elatine* (L.) Wettst., *Linaria elatine* (L.) Mill. — Annual, glandular-pubescent to hirsute, stems procumbent to 10-40 cm long, ramified at base. **Seeds ellipsoid to ovate or obovate, dorsal side convex, ventral slight flat, base with hilum, 1.1-1.3 x 0.7-0.9 mm. Surface alveolate or reticulate, dull, dark-brown. 2n = 36.** Native to Europe, cultivated fields and other open habitats, in warmer areas scattered to plentiful; in all Carpathian territories.

**3143. *Kickxia spuria*** (L.) Dumort., *Linaria spuria* (L.) Mill. — Annual, stems 20-50 cm long, decumbent, glandular-pubescent to villous. **Seeds oblong-ellipsoid, obovoid, dorsal and ventral sides convex, base with hilum, 1.2-1.6 x 0.8-1 mm. Surface reticulate-alveolate, dull, dark-brown. 2n = 18.** Native to Eurasia, cultivated fields and other habitats in southwestern and central Europe. Hu, Pl, Ro, Sk.

**3144. *Digitalis ferruginea*** L. — Perennial, stems erect, glabrous or puberulent, 50-120 cm high, simple or branched above, with leafy rosette at base. **Seeds**

**irregular shaped, mostly ellipsoid and rhomboid, dorsal side convex, ventral flat with deep suture, 1.7-2 x 0.9-1.1 mm. Surface reticulate-foveate, slight lustrous, brown to dark-brown.** Native to southern Europe, forest margins, clearings and cut-over areas. Hu, Ro.

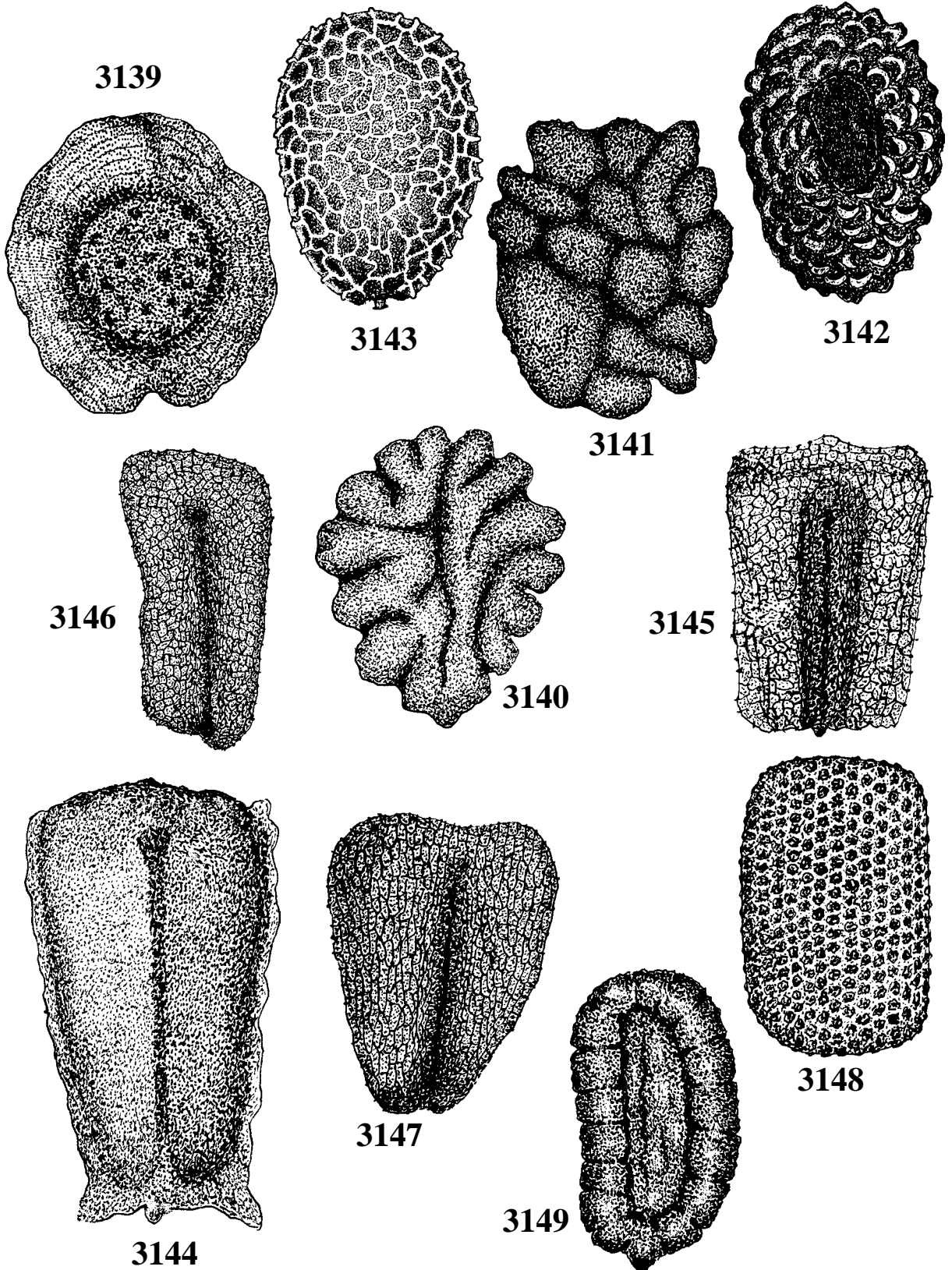
**3145. *Digitalis grandiflora*** Mill., *D. ambigua* Murray — Biennial to perennial, stems 30-100 cm high, leaves ovate-lanceolate, finely serrate. **Seeds cylindric or angular, dorsal side convex, ventral concave, with longitudinal furrow, 1-1.3 x 0.6-0.8 mm. Surface fine reticulate-foveate, lustreless, pale-brown, reticulum whitish. 2n = 56.** Native to eastern and central Europe, in woods. Br, Hu, Pl, Ro, Sk, Uk.

**3146. *Digitalis lanata*** Ehrh. — Biennial or perennial, stems erect, 30-100 cm high, glabrous, often reddish, reddish purple. **Seeds irregular, prismatic, 4-angular, oblong, dorsal side convex, ventral flat with longitudinal suture, 1.5-1.8 x 0.7-0.9 mm. Surface reticulate-foveate, slight lustrous, cinnamon-brown. 2n = 56.** Native to the Balkan Peninsula, shrubby and grassy places of dryer uplands; grown as a medical plant. Hu, Mo, Ro, Sk, Uk.

**3147. *Digitalis lutea*** L., *D. parviflora* Lam. non Jacq. — Perennial, stems erect, 60-100 cm high, glabrous or slightly pubescent. **Seeds prismatic, obovoid, dorsal side convex, ventral slight flat with longitudinal suture, 1.1-1.4 x 0.8-1 mm. Surface reticulate-foveate, lustrous, brown. 2n = 56, 112.** Native to southwestern Europe, in dry woodlands, light thickets, mountain forest, clearings and felling areas; seldom grown for ornament. Pl, Sk.

**3148. *Digitalis purpurea*** L. — Biennial to perennial, pubescent to tomentose, stems erect, 50-150 cm high. **Seeds cylindric or 4-angular, prismatic, dorsal side convex, ventral flat with distinct longitudinal suture, 0.6-0.8 x 0.4-0.6 mm. Surface fine whitish reticulate, dull, light- to deep-brown. 2n = 56.** Native to Europe, light forests and shrubberies, forest margins, cut-over areas, usually a calcifuge; cultivated for ornament and as a medicinal plant, widely naturalized. Hu, Mo, Pl, Ro, Sk, Uk.

**3149. *Erinus alpinus*** L. — Perennial, stems thin, 5-10 cm high, with minute white, pink or carmine-red flowers, leaves shovel-shaped in a rosette, notchedly dentate at apex. **Seeds ellipsoid, dorsal**





**side longitudinal and horizontal furrowed, ventral with deep and broad suture, 0.6-0.8 x 0.35-0.45 mm. Surface swelling, lustrous, dark-brown.** Native to Alps and Pyrenees; in the Carpathians rarely cultivated as an ornamental in rock-gardens.

**3150. *Veronica acinifolia* L., *V. perpusilla* Boiss.** — Annual, glandular-pubescent, stems erect, 5-20 cm high, branched above. **Seeds broad ellipsoid or obovoid, dorsal side convex, ventral concave, 0.7-0.9 x 0.5-0.6 mm. Surface smooth, slight lustrous, dark-yellowish. 2n = 14, 16.** Native to Europe, cultivated grounds and damp grasslands at elevations up to 1500 m. Hu, Ro, Sk, Uk.

**3151. *Veronica agrestis* L., *V. obscura* Dumort., *V. pulchella* Bastard** — Annual, pubescent, stems procumbent or decumbent, 5-30 cm high. **Seeds broad elliptic to globose, obovoid, dorsal side convex, ventral scaled with hilum in the middle, 1.4-1.8 x 1-1.3 mm. Surface dull, tuberculate, yellowish to brownish-yellow. 2n = 28.** Native to Europe, cultivated grounds, fields, gardens, orchards, forests, somewhat a calcifuge; throughout the Carpathians.

**3152. *Veronica alpina* L., *V. pumila* All.** — Perennial, stems ascending, 5-15 cm high, glabrous or pubescent. **Seeds broad oval to globose, compressed, dorsal side convex, ventral concave, scaled, 0.9-1.1 x 0.6-0.8 mm. Surface fine granulate, lustrous, yellowish-brown.** Native to Eurasia, rocky and stony slopes, in subalpine and alpine moist meadows. Pl, Ro, Sk, Uk.

**3153. *Veronica anagallis-aquatica* L., *V. acutifolia* Gilib., *V. tenerrima* F. W. Schmidt** — Perennial (annual), stems  $\pm$  erect, glabrous or glandular-pubescent, 30-100 cm long, 4-angular, simple to richly ramified. **Seeds obovoid, ellipsoid, suborbicular biconvex or convexo-concave, chalaza excentric, 0.5-0.7 x 0.4-0.5 mm. Surface granulate, lustrous, yellowish. 2n = 18.** Native to Europe, streamsides, wet muds, shallow waters, meadows of montane and subalpine zones in all Carpathian territories.

**3154. *Veronica anagalloides* Guss., *V. salina* Schur, *V. tenuis* Ledeb.** — Annual, stems erect, full, 20-30 cm high, simple or with long twigs from the base, glabrous. **Seeds ovate to globose or rhombic, compressed, dorsal side convex, ventral flat, mostly with excentric hilum, 0.5-0.6 x 0.3-0.4 mm. Surface granulate, lustrous, pale-orange. 2n = 18.** Native to

Eurasia, fairly rare in ditches, streamsides, wet muds and marshy soils. Hu, Mo, Pl, Ro, Sk, Uk.

**3155. *Veronica aphylla* L., *V. depauperata* Waldst. et Kit.** — Perennial, pubescent, stems erect or procumbent, 1-5 cm. **Seeds broad oval to obovoid, flattish, dorsal side convex, ventral concave, with indistinct central hilum, 1.2-1.5 x 1-1.2 mm. Surface fine granulate, lustrous, yellowish light-brown. 2n = 18.** Native to central and southern Europe, mountain rocks and stony alpine pastures. Pl, Ro, Sk, Uk.

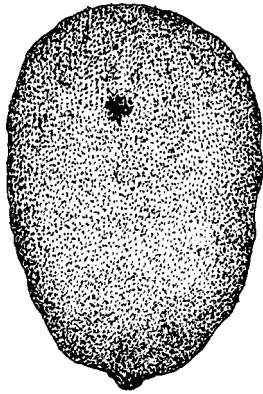
**3156. *Veronica arvensis* L., *V. micrantha* Schur, *V. polyanthos* Thuill.** — Annual, stems erect or ascendent, 5-40 cm, pubescent, glandular above, ramified from the base. **Seeds obovoid to ellipsoid, compressed, dorsal side convex, ventral scaly concave, 0.9-1.3 x 0.5-0.7 mm. Surface dull, fine granulate, yellowish to orange. 2n = 14, 16.** Native to Eurasia, fields, fallows, grassy and stony slopes, roadsides, boundaries, coasts, scrubs, open forests; in the whole Carpathians.

**3157. *Veronica austriaca* L. subsp. *dentata* (F. W. Schmidt) Watzl, *V. dentata* F. W. Schmidt** — Perennial, stems erect or ascendent, 10-50 cm. **Seeds obovoid to ellipsoid, flattish, biconvex, ventral side with central oval rib and distinct suture in the lower half, 1.4-1.8 x 1.2-1.6 mm. Surface slight wrinkly, granulate and lustrous, light-brown to brown. 2n = 32, 64.** Native to central and southern Europe, forest steppes, forest margins, sunny dry uplands; throughout the Carpathians.

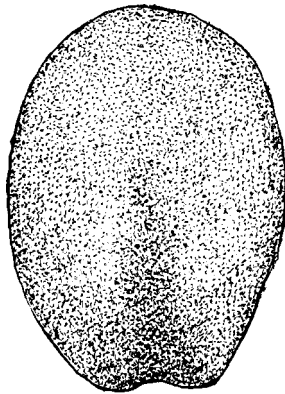
**3158. *Veronica bachofenii* Heuff., *V. media* Baumg. non Schrad.** — Perennial, stems erect, 20-30 cm high, puberulent. **Seeds obovoid, ellipsoid to globose, compressed, dorsal side convex, ventral flat, chalaza excentric, 0.9-1.1 x 0.6-0.8 mm. Surface granulate, slight lustrous, yellowish-brown.** Native to the Balkan Peninsula and Asia Minor, rocky and stony slopes of mountains. Ro.

**3159. *Veronica barrelieri* Schott ex Roemer et Schultes, *V. spicata* subsp. *barrelieri* (Schott ex Roemer et Schultes) Murb., *V. stepacea* Kotov** — Perennial, stems 20-45 cm high, whole plant covered with long, stiff, whitish, eglandular hairs. **Seeds ellipsoid, dorsal side convex, ventral concave, 1.1-1.3 x 0.7-0.8 mm. Surface fine waved, slight lustrous, pale-brown. 2n = 34.** Native to southeastern Europe, dry steppes and stony slopes. Uk.

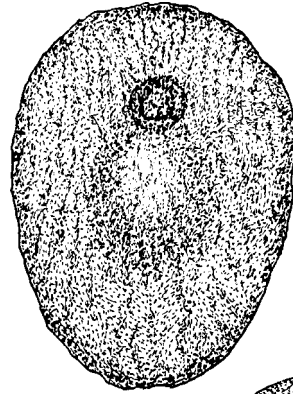




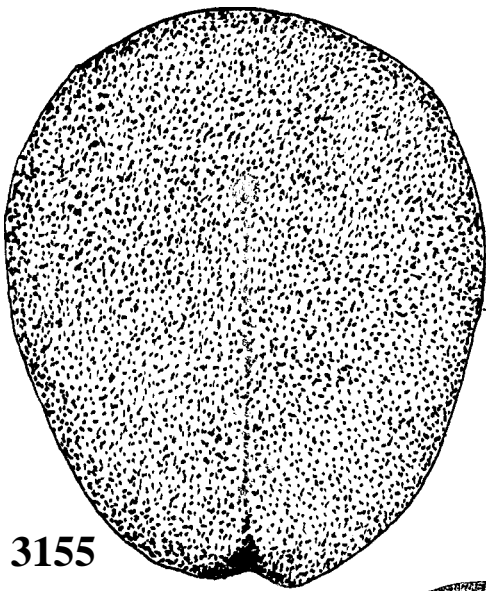
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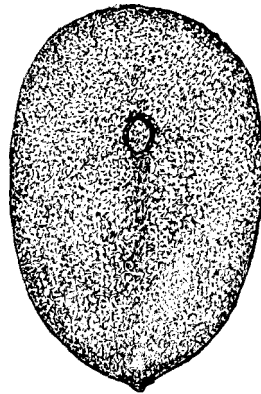
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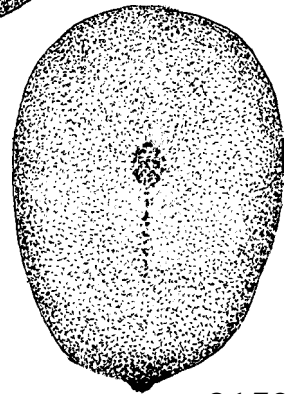
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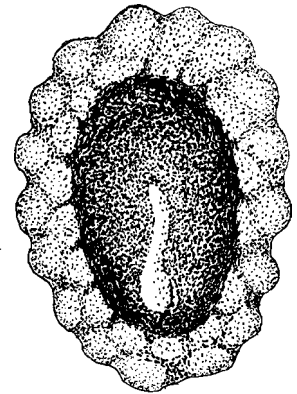
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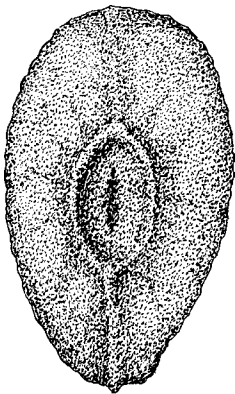
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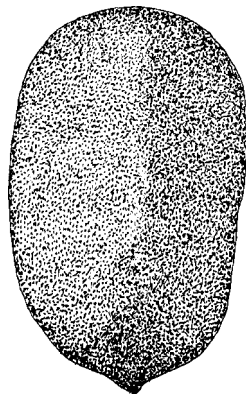
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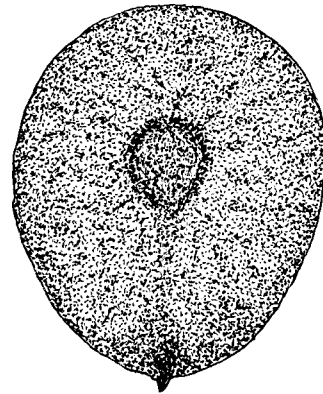
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**3160. *Veronica baumgartenii*** Roem. ex Schult., *V. petraea* Baumg. — Perennial, stems 3-12 cm high, ascendent, glabrous below, pubescent and ramified above. **Seeds broad ellipsoid to spheroid, dorsal side convex, ventral concave, chalaza and suture indistinct, 1.2-1.5 x 0.9-1.1 mm. Surface granulate, lustrous, yellowish-brown.** Native to the Carpathians and northern Balkan mountains, rocky slopes of subalpine and alpine zones. Pl, Ro, Uk.

**3161. *Veronica beccabunga*** L. — Perennial, glabrous, stems creeping, rooting, down, ends ascendent, 20-60 cm high. **Seeds ellipsoid, sometimes angular, dorsal side convex, ventral side flat with small hilum in the centre, 0.5-0.7 x 0.4-0.5 mm. Surface wrinkly-granulate, lustrous, orange. 2n = 18.** Native to Eurasia, margins of flowing, more rarely stagnant waters, banks of streams, brooks and springs, a medicinal plant; throughout the Carpathians.

**3162. *Veronica bellidioides*** L. — Perennial, stems ascendent or erect, 5-20 cm high, unramified, pubescent throughout. **Seeds globose or elliptic, dorsal side convex, ventral concave, 1-1.2 x 0.8-1 mm. Surface granulate, lustrous, yellowish-brown.** Native to Eurasia, grassy, ruderal places, shrubberies clearings and light forests, dry alpine pastures, a calcifuge. Pl, Ro, Uk.

**3163. *Veronica catenata*** Pennell, *V. aquatica* Bernh. non S. F. Gray — Perennial, stems hollow, similar to those of *V. anagallis-aquatica*. **Seeds ellipsoid to obovoid, biconvex, chalaza excentric, 0.5-0.7 x 0.3-0.5 mm. Surface fine reticulate-foveate, dull, yellowish-brown. 2n = 36.** Native to Europe, in or along still or slow-flowing waters, wet muds, meadows, pastures; in all Carpathian territories.

**3164. *Veronica chamaedrys*** L. — Perennial, stems ascendent, 7-25 cm high, scattered or densely hirsute. **Seeds oblong to broad oval, lateral compressed, dorsal side slight convex, ventral slight concave, 1-1.3 x 0.7-0.9 mm. Surface dense granulate, fine lustrous, yellowish to light-brown. 2n = 32.** Native to Europe, common in meadows, hedges, woods, scrubs, roadsides, open places; throughout the Carpathians.

**3165. *Veronica cymbalaria*** Bodard — Perennial, pubescent, stems up to 60 cm long, procumbent, leaves 5- to 9-lobed with subequal lobes, flowers white. **Seeds obovoid to subglobose, shell-shaped, dorsal side convex with suture in the middle,**

**ventral with large and deep cavity, at the edge curved, 2.2-2.8 x 1.9-2.3 mm. Surface of dorsal side waved, lateral side slight ribbed, faint lustrous, yellowish-brown. 2n = 18, 36, 54.** Native to southern European cultivated grounds and other dry, open habitats; rare hauling into the Carpathians, mostly with cereals.

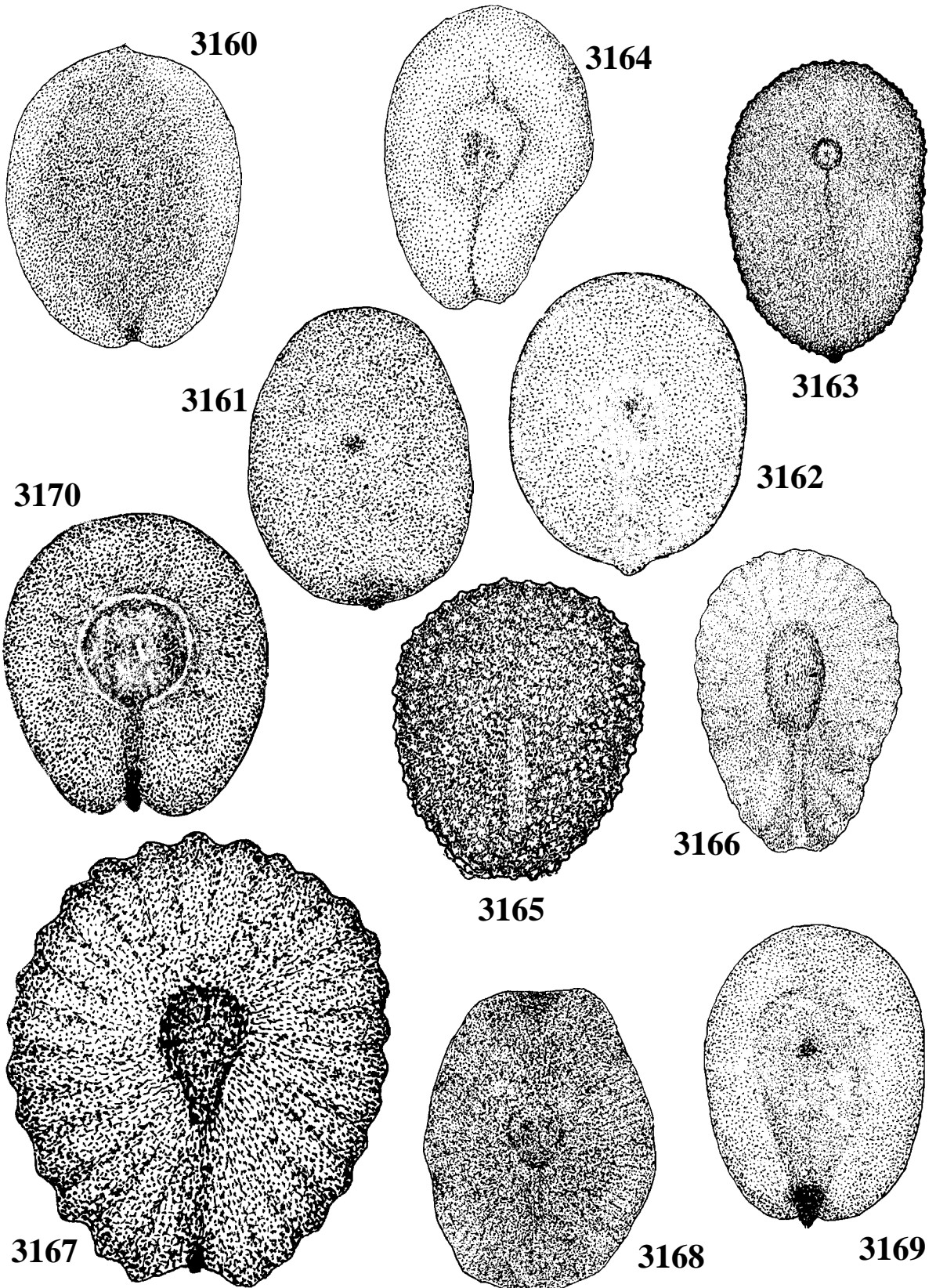
**3166. *Veronica dillenii*** Crantz, *V. campestris* Schmalh. — Annual, stems 10-30 cm high, robust, densely glandular. **Seeds obovoid, ellipsoid, compressed, shield-like, dorsal side convex, ventral flat with distinct chalaza and seam, 1-1.3 x 0.8-1 mm. Surface dense granulate, smooth, dull, yellowish-brown. 2n = 16.** Native to Eurasia, sunny, grassy slopes, fallows, sandbanks, roads; in all Carpathian territories.

**3167. *Veronica filiformis*** Sm. — Perennial, stems procumbent, tufted, ramified, up to 50 cm high, rooting down at knots, glandular, hirsute. **Seeds elliptical, slight excavated, shallow concave on ventral side, convex on dorsal side, 1.2-1.4 x 1-1.2 mm. Surface dense granulate, dull, yellowish to brown. 2n = 14.** Originally growing in Asia Minor and the Caucasus, humid forests, meadows, waste fields, riversides; in the Carpathians cultivated as an ornamental, now widespread as a weed. Ro, Sk, Uk.

**3168. *Veronica fruticans*** Jacq., *V. saxatilis* Scop. — Perennial, tufted, glabrous, stems ascendent or erect, 5-20 cm high, ramified. **Seeds ellipsoid, obovoid to subglobose, compressed, dorsal side convex, ventral concave with hilum in the centre, 1.2-1.4 x 0.9-1.1 mm. Surface shallow granulate, dull, reddish-yellow. 2n = 16.** Native to central and southern Europe, rocks and stony grasslands, of subalpine and alpine zones. Pl, Ro, Sk, Uk.

**3169. *Veronica fruticulosa*** L. — Perennial, stems woody below, 10-30 cm high, erect or ascendent, branched above, shortly hirsute. **Seeds ellipsoid or obovoid, biconvex, broad wing around, dorsal side with distinct rib in the lower half, ventral side with chalaza in the upper 1/3 of the seed, 1.2-1.5 x 0.9-1.1 mm. Surface granulate, dull, yellowish-brown to brown.** Native to northern and central Europe, stony and gravelly mountain slopes, frequent in south expositions, calcicole. Uk (?).

**3170. *Veronica gentianoides*** Vahl, *V. pallida* Hornem. — Perennial, stems erect or ascendent, 30-100 cm high, simple, purple in the upper part.



Seeds nearly spherical, ellipsoid or obovoid, dorsal side convex with rib in the lower half, ventral side concave, scaled, having large chalaza with a rib around, 1.6-2 x 1.6-1.8 mm. Surface granulate, dull or faint lustrous, yellowish-brown. Native to south-eastern Europe and Asia Minor, mountain meadows, grassy slopes, forest clearings of subalpine and alpine zones. Uk.

**3171. *Veronica hederifolia*** L. — Annual, stems hirsute, ramified at base, shoots procumbent or ascending, 5-60 cm high. **Seeds ellipsoid to subglobose, shell-shaped, dorsal side convex, ventral with large and deep cavity, ribbed, at the edge curved, involute and thinnish with many ribs, 2-2.6 x 1.8-2.4 mm. Surface strong rugose,  $\pm$  smooth, yellowish-violet.  $2n = 54$ .** Native to Eurasia, as a weed in fields and gardens, along roadsides, in wastelands, woods, clearings, dunes, vineyards, shady rocky places; in all Carpathian regions.

**3172. *Veronica jacquinii*** Baumg., *V. austriaca* subsp. *jacquinii* (Baumg.) Watzl., *V. bihariensis* A. Kern. — Perennial, stems 40-100 cm high, mostly single or 2-3 leaves sessile. **Seeds irregular shaped, strong compressed, 1.7-2.1 x 1.4-1.6 mm. Surface waved, faint lustrous, pale-brown.  $2n = 48$ .** Native to eastern Europe; in the East Carpathian steppe uplands. Hu, Mo, Pl, Ro, Sk, Uk.

**3173. *Veronica montana*** L., *V. subbiscutata* Crantz — Perennial, sparsely hirsute, stems decumbent, 15-40 cm long, rooting down, ends ascending. **Seeds suborbicular to ellipsoid, compressed, biconvex, with central hilum and indistinct seam, 1.9-2.2 x 1.6-1.8 mm. Surface fine wrinkly, granulate, lustrous, lemon-yellow.  $2n = 18$ .** Native to southern Europe, damp, shady deciduous forest, downs and mountains up to 1500 m high; throughout the Carpathians.

**3174. *Veronica officinalis*** L., *V. depressa* Schur, *V. lanceolata* Opiz — Perennial, shortly hirsute, stems procumbent, rooting down, ends ascending, 10-50 cm high. **Seeds lens-shaped, ellipsoid, suborbicular, dorsal and ventral sides slight convex, ventral side with distinct seam in the lower half, 0.9-1.2 x 0.7-0.9 mm. Surface granulate, slight lustrous, yellow to dark-yellow, hilum dark-brown.  $2n = (18), 36$ .** Native to Europe, common in grasslands, woods, heaths, meadows, roadsides; in all Carpathian territories.

**3175. *Veronica opaca*** Fries, *V. friesiana* Knaf — Annual, stems procumbent, densely hirsute, 10-30 cm high, simple or ramified at base. **Seeds obovoid to ellipsoid, dorsal side wrinkly, ventral concave, clear cymbiform with bended edge, 1.4-1.8 x 1-1.3 mm. Surface reticulate-foveate, brownish-yellow.  $2n = 28$ .** Native to Eurasia, cultivated grounds, vineyards, waste places; throughout the Carpathians.

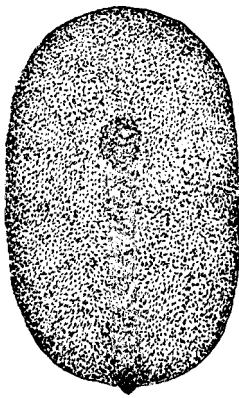
**3176. *Veronica orientalis*** Mill. — Perennial, stems numerous, 10-30 cm high, ascending, woody at base, hirsute. **Seeds ovate to suborbicular, dorsal side convex, ventral flat with large chalaza and distinct seam, 1.8-2 x 1.4-1.6 mm. Surface wrinkly and granulate, slight lustrous, brown.** Native to western Asia, scrubs, steppes, pastures, meadows, screes, fallows, wet places. Ro.

**3177. *Veronica peduncularis*** M. Bieb. — Perennial, sparsely pubescent throughout, stems 10-30 cm high, ascending, diffuse. **Seeds obovoid, bottom gradually narrow, dorsal side convex, ventral concave, 1.7-1.9 x 1.2-1.4 mm. Surface granulate, slight lustrous, pale yellowish-brown.** Native to southeastern Europe, shady woods, thickets, stony slopes. Uk.

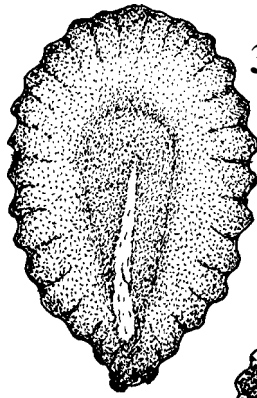
**3178. *Veronica peregrina*** L., *V. pallescens* Gaterau — Annual, glabrous, glandular, stems erect, 5-25 cm, simple or ramified at base. **Seeds elliptical, dorsal side convex, with distinct rib in the lower half, ventral side flat with excentric chalaza and indistinct seam, 0.6-0.8 x 0.3-0.5 mm. Surface reticulate-foveate, dull, yellowish pale-brown.  $2n = 54$ .** Originally growing in South America, hauling into riverbanks and roadsides, cultivated grounds, damp waste places, widely naturalized in western and central Europe. Hu, Mo, Ro, Sk, Uk.

**3179. *Veronica persica*** Poir., *V. tournefortii* C. C. Gmel. non Vill. — Annual, pubescent, stems procumbent or ascending, shoots 15-50 cm high. **Seeds broad elliptical, convex on dorsal side, cymbiform concave on ventral side, 1.8-2.2 x 1.3-1.5 mm. Surface reticulate-foveate, dull, yellowish to pale-brown.  $2n = 28$ .** Native to Asia, weedy places, wastelands, common in cultivated lands as a weed; in the Carpathians hauling and naturalized.

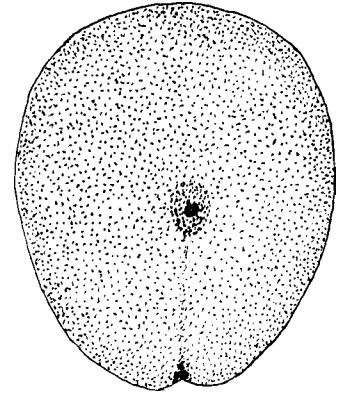
**3180. *Veronica polita*** Fries, *V. didyma* auct. vix Ten. — Annual, stems procumbent, ends ascending, 5-25 cm, hirsute, ramified at base. **Seeds obovoid to**



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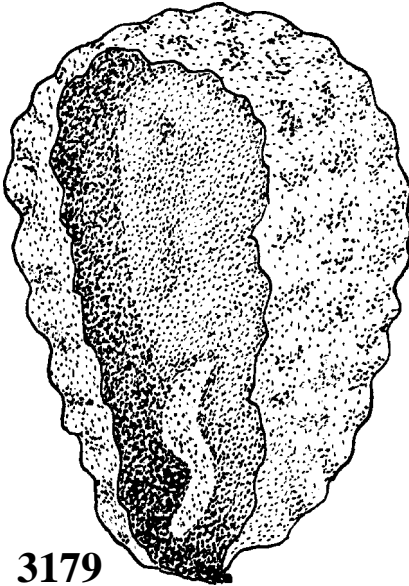
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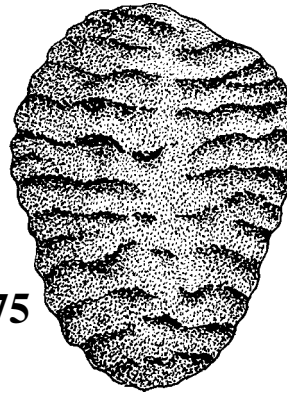
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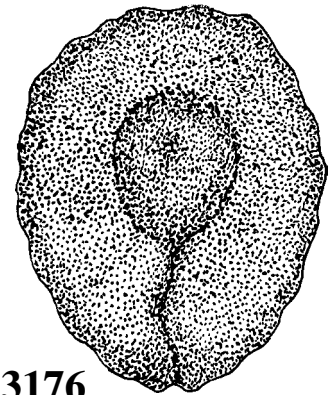
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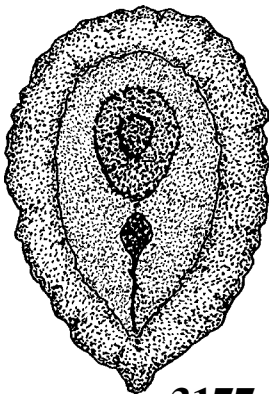
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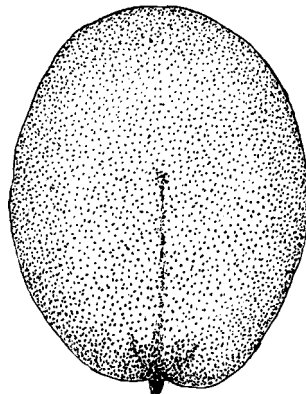
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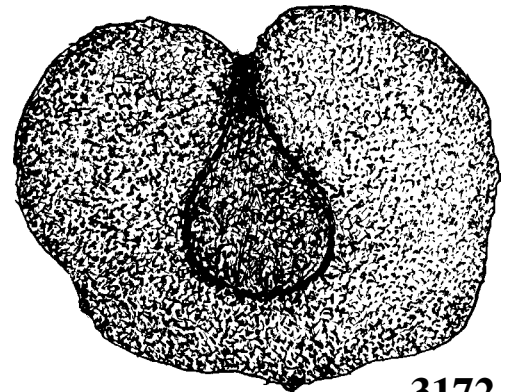
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oval, dorsal side convex, ventral concave, cymbiform, on lateral side with parallel ridges, 1.4-1.7 x 0.9-1.1 mm. Surface dull, pale yellowish.  $2n = 14$ . Native to Eurasia, bare places, open forests, steppes, cultivated lands, roadsides, now a cosmopolitan weed; throughout the Carpathians.

**3181. *Veronica praecox*** All., *V. segetalis* Pers., *V. viscosa* Kit. ex A. Dietr. — Annual to biennial, glandularly downy, stems erect, 5-20 cm high, simple or ramified from base. **Seeds ovate to obovoid, dorsal side convex, ventral strong cymbiform with bended edge, 1.1-1.3 x 0.9-1.1 mm. Surface granulate, dull, yellowish-rusty.  $2n = 18$ .** Native to Eurasia, grassy and loamy slopes and embankments, rocky steppes, pastures, fields; almost in all Carpathian regions.

**3182. *Veronica prostrata*** L., *V. filicaulis* Halácsy — Perennial, tufted, densely downy, stems procumbent, 10-30 cm high. **Seeds subglobose to obovoid, compressed, dorsal side slight convex, ventral with central oval hilum and seam, 1.4-1.6 x 1.2-1.4 mm. Surface wrinkly and granulate, slight lustrous, yellowish-brown to brown.  $2n = 32$ .** Native to Eurasia, dry steppe slopes, meadows, light forests, shrubberies, in the mountains, light forests, shrubberies, in the mountains up to 1500 m high; throughout the Carpathians.

**3183. *Veronica scutellata*** L., *V. connata* Raf., *V. villosa* Steud. — Perennial, glabrous, rarely pubescent, stems ascending, slender 20-50 cm high, rooting-down below, ascendent. **Seeds oval to globose, flattish, dorsal side convex, ventral flat or concave with hilum in the centre and indistinct seam, 1.2-1.5 x 0.9-1.1 mm. Surface reticulate-foveate, lustrous, pale to dark-brown.  $2n = 18$ .** Native to Europe, marshes and other wet places from lowlands to mountains; in all Carpathian regions.

**3184. *Veronica serpyllifolia*** L., *V. fontana* Willd. ex Link, *V. microphylla* Kit. — Perennial, stems ascendent 5-30 cm high, ends erected, shortly downy, glandular above. **Seeds ellipsoid, compressed, dorsal side slight convex, ventral flat or slight concave, hilum round, seam faint distinct, 0.6-0.8 x 0.4-0.5 mm. Surface fine reticulate-foveate, ribbed, dull, yellowish.  $2n = 14$ .** Native to whole Europe, most sandy places, meadows, pastures, roadsides, field edges, shady forests, riverbanks; in all Carpathian territories.

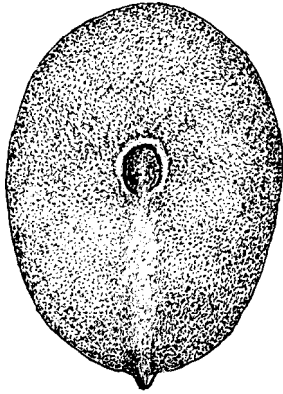
**3185. *Veronica sublobata*** M. A. Fisch., *V. hederifolia* L. subsp. *lucorum* (Klett et Richter) Hartl — Annual, similar to *V. hederifolia*, stems longly hirsute. **Seeds ellipsoid to subglobose, cup-shaped, dorsal side convex, ventral curved at the edge with large deep cavity, 2.4-2.8 x 2-2.4 mm. Surface rugose, ribbed, clear involute, dull, blackish-grey.  $2n = 36$ .** Native to Europe; woods and hedges, shrubberies, gardens, also as a weed in cultivated grounds, from lowland to subalpine zones; common in the Carpathians.

**3186. *Veronica teucrium*** L., *V. latifolia* L. — Perennial, stems erect or shortly ascendent, 30-100 cm high, unramified. **Seeds ellipsoid to globose, compressed, dorsal side, slight convex, ventral flat with central oval and seam in the inferior half, 1.3-1.6 x 1.1-1.2 mm. Surface granulate, lustrous, yellowish-brown.  $2n = 64$ .** Native to Eurasia, light woodlands, forest steppes, shrubby slopes of warmer areas; in all Carpathian territories.

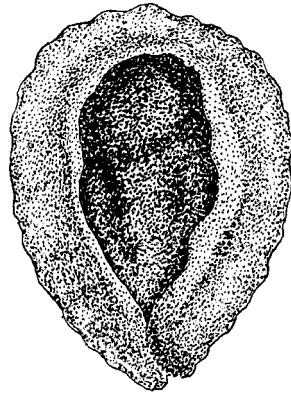
**3187. *Veronica triloba*** (Opiz) Opiz — Annual, similar to *V. sublobata*, but with rough, fleshy and pulpy leaves. **Seeds subglobose to ellipsoid, cup-shaped, dorsal side convex, ventral curved at edge with large and deep cavity, 1.8-2.2 x 1.5-1.9 mm. Surface rugose, dull, ribs indistinct, clear involute, brown or dark-grey.  $2n = 18$ .** Native to Europe, cultivated fields, rocks and other dry open, sunny habitats. Ro, Sk, Uk.

**3188. *Veronica triphyllos*** L., *V. quinquefida* Gilib. — Annual, glandularly downy, stems erect or ascendent, 5-20 cm high, simple or ramified from base. **Seeds broad obovate, suborbicular, dorsal side convex, ventral concave, scale-shaped with distinct chalaza and seam, 1.3-1.7 x 1.1-1.3 mm. Surface slight rugose and lustrous, dark-brown.  $2n = 14$ .** Native to Eurasia, fields, fallows, boundaries, grassy embankments, forests, stony pastures, rocky hills; throughout the Carpathians.

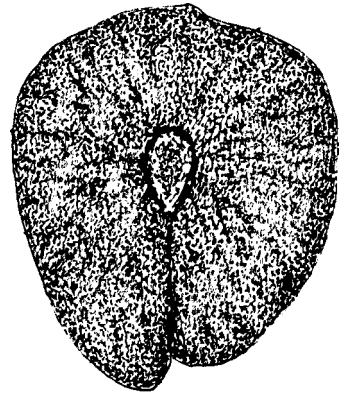
**3189. *Veronica urticifolia*** Jacq., *V. maxima* Mill. — Perennial, robust, scattered hirsute, stems single, erect, 20-70 cm high, unramified. **Seeds ellipsoid to globose or obovoid, compressed, dorsal side convex, ventral flat or concave with darker central hilum and mostly indistinct seam, 1-1.2 x 0.8-1 mm. Surface fine wrinkly, lustrous, yellow to yellowish-brown.  $2n = 18$ .** Native the southern and central Europe, mainly in mountain areas at altitudes below 2000 m. Pl, Ro, Sk, Uk.



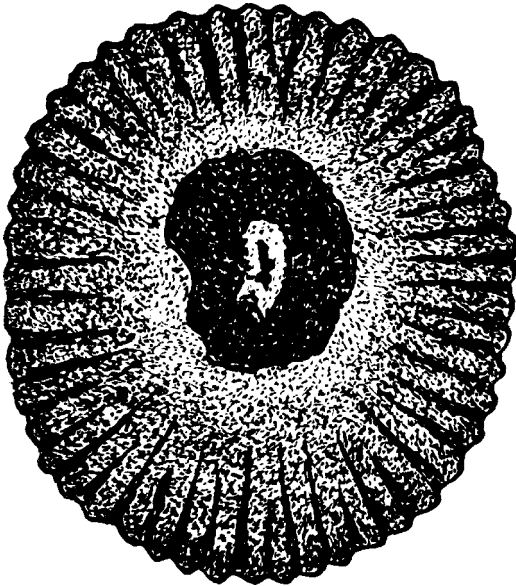
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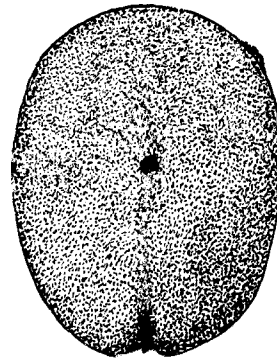
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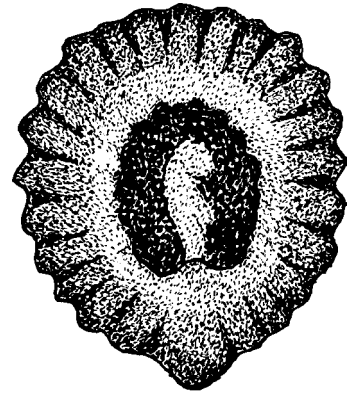
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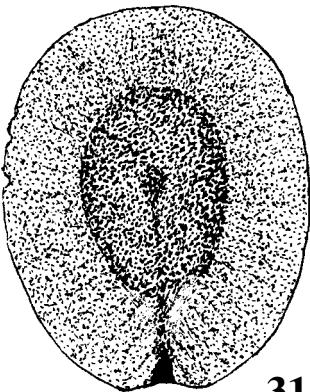
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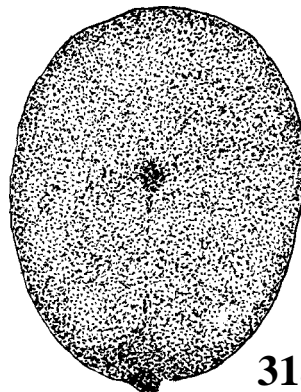
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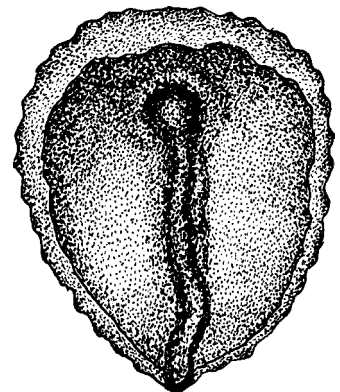
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**3190. *Veronica verna*** L., *V. brevistyla* Moris, *V. trifida* Gilib. — Annual, stems erect, 5-15 cm high, simple or branched from the base, downy below, glandular above. **Seeds obovoid to spheroid or ellipsoid, compressed, dorsal side convex, ventral flat with chalaza and seam, 1.1-1.3 x 0.8-1 mm. Surface slight sinuate, granulate, dull, yellowish-brown. 2n = 16.** Native to Eurasia, sunny and grassy, forest, rocky and sandy steppes, pastures, meadows, a calcifuge; throughout the Carpathians.

**3191. *Veronica vindobonensis*** M. A. Fisch., *V. chamaedrys* subsp. *vindobonensis* M. A. Fisch. — Perennial, stems 10-25 cm high, whole stem hairy only in 2 rows. **Seeds ellipsoid, strong compressed with distinct chalaza and seam, 1.1-1.3 x 0.9-1 mm. Surface granulate, slight lustrous, yellowish. 2n = 16.** Native to Europe, sunny, shrubby slopes and warm oak forests. Sk.

**3192. *Pseudolysimachion incanum*** (L.) Holub, *Veronica spicata* L. subsp. *incana* (L.) Walters — Perennial, stems erect, stout, 20-60 cm high, simple or little ramified. **Seeds ellipsoid to ovoid, dorsal side convex, ventral flat with excentric chalaza and slight distinct seam, 0.8-1.1 x 0.6-0.7 mm. Surface granulate, slight lustrous, brown. 2n = 68.** Native to Eurasia, stony and rocky slopes, dry pine forests, saline meadows of subalpine and alpine zones. Hu, Mo, Pl, Ro, Sk, Uk.

**3193. *Pseudolysimachion longifolium*** (L.) Opiz, *Veronica longifolia* L. — Perennial, scattered downy, stems erect, 40-120 cm, simple, rarely ramified above. **Seeds ellipsoid to obovoid or globose, with distinct paler and stronger central area, dorsal side convex, ventral flat or slight tend to seam, 1-1.2 x 0.6-0.8 mm. Surface fine granulate, lustrous, pale-brown. 2n = 34, 68.** Native to Eurasia, wet meadows, boundaries, lowland wet forests, coastal shrubberies; in all Carpathian regions.

**3194. *Pseudolysimachion orchideum*** (Crantz) Wraber, *Veronica orchidea* Crantz — stems bare below, hirsute above, 30-60 cm high, simple, rarely ramified. **Seeds obovoid, elliptic, dorsal side convex, ventral flat, chalaza excentric, seam indistinct, 1.1-1.2 x 0.7-0.8 mm. Surface granulate, slight lustrous or dull, brown. 2n = 34.** Native to southeastern Europe, deciduous forests, dry grasslands, open slopes, dry shrubberies of warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**3195. *Pseudolysimachion spicatum*** (L.) Opiz, *Veronica spicata* L. — Perennial, densely downy, sometimes glandular, stems erect, 5-60 cm high. **Seeds obovate, ellipsoid, dorsal side convex, ventral flat or concave with small chalaza, 0.9-1.1 x 0.5-0.7 mm. Surface smooth or fine granulate, dull, brown to dark-brown. 2n = 68.** Native to Eurasia, sunny grassy slopes, light forests and shrubberies, forest margins; in all Carpathian territories.

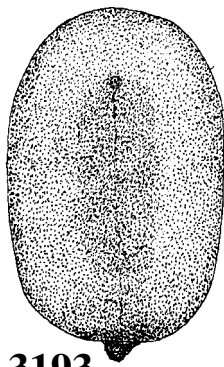
**3196. *Pseudolysimachion spurium*** (L.) Rauschert — Perennial, pubescent or glabrous, stems erect to ascendent, 30-100 cm high, branched. **Seeds ellipsoid, dorsal side convex, ventral mostly flat with chalaza in the upper third, 0.8-1 x 0.5-0.6 mm. Surface granulate, dull, brown. 2n = 34.** Native to eastern Europe, dryer light forests and shrubby slopes. Hu, Mo, Ro, Sk, Uk.

**3197. *Hebe speciosa*** (R. Cunn. ex A. Cunn.) Andersen — Shrub, up to 150 cm high, of compact habit, young twigs glabrous. **Seeds ellipsoid, much compressed, dorsal side slight convex, ventral slight concave, chalaza excentric, 1.3-1.5 x 0.9-1.1 mm. Surface fine granulate, lustreless, greyish-yellow.** Originally spread from New Zealand; in the Carpathians very rarely cultivated for ornament, mostly at hedges near the sea, water areas or river-banks.

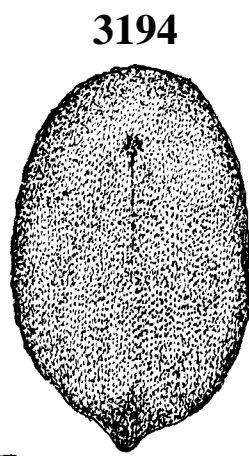
**3198. *Melampyrum arvense*** L., *M. purpurascens* Gilib. — Annual, stems erect, ramified, 10-50 cm high. **Seeds prolonged ellipsoid or ovoid, slight crooked on one side, dorsal side convex with or without a rib, ventral side concave with deep and broad furrow, apex rounded, base with brown caruncle, 4.9-5.7 x 2-2.2 mm. Surface smooth, slight lustrous, black. 2n = 18.** Native to southern Europe, hauling with cereals into central and northern lowlands and uplands; in all Carpathian regions.

**3199. *Melampyrum barbatum*** Waldst. et Kit. ex Willd. — Annual, stems 15-40 cm high, erect, simple or ramified, pubescent. **Seeds ellipsoid or ovoid, slight crooked on one side, dorsal side convex, ventral with two prolonged furrows, apex rounded or apiculate, base without caruncle, only with concave whitish hilum, 4.2-5 x 2.4-2.8 mm. Surface smooth, slight lustrous, brownish-black to black.** Native to Balkan Peninsula, fields, fallows, light forests and shrubberies, boundaries. Hu, Ro, Sk.

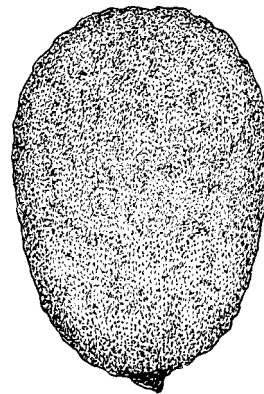




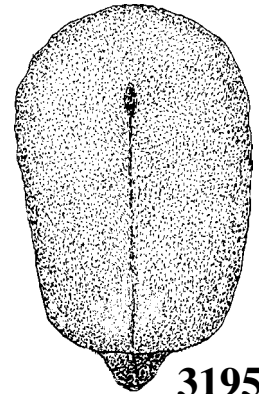
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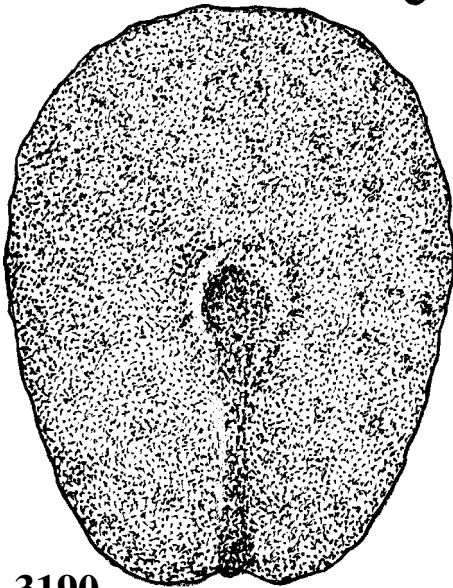
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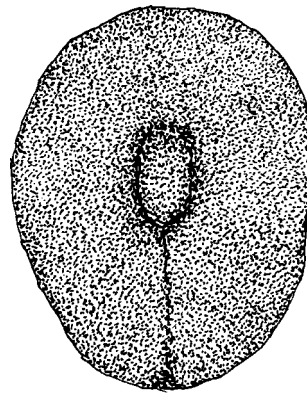
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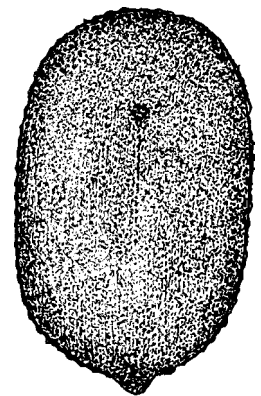
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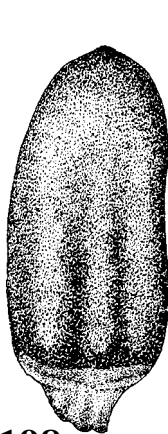
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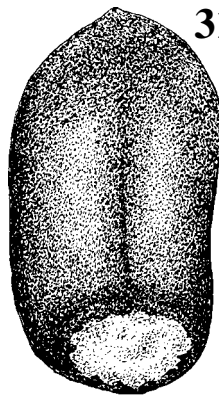
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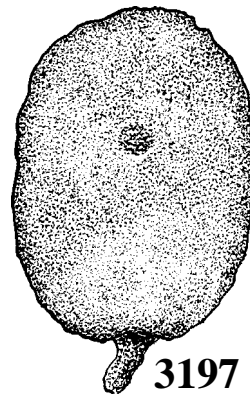
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**3200. *Melampyrum bihariense*** A. Kern., *M. subalpinum* (Jur.) A. Kern. — Annual, stems 20-50 cm high, simple or branched, pubescent, leaved lanceolate or ovate-lanceolate. **Seeds oblong ellipsoid with large foot at bottom, dorsal side convex, ventral flat with deep and broad furrow, 4.6-5 x 1.8-2 mm. Surface very shallow and longitudinal furrowed, lustreless, dark-brown.** Native to southern Europe, shrubberies, wood margins of upland and montane zones. Hu, Ro.

**3201. *Melampyrum cristatum*** L., *M. ronnigeri* Poev. — Biennial, stems erect, 15-50 cm high, simple or ramified, pubescent, rarely glabrous. **Seeds prolonged ellipsoid to ovoid, bottom 1/4 with fleshy caruncle, upper 3/4 in transversal section ± globose, slightly crooked on one side, apex rounded, 3.6-4.6 x 1.3-1.7 mm. Surface with one deeper prolonged furrow, smooth, dull, glabrous, black. 2n = 18.** Native to Euro-Siberia, light deciduous woodlands, forest margins, shrubby slopes of both lowlands and mountains; in all Carpathian regions.

**3202. *Melampyrum herbichii*** Wol., *M. sylvaticum* subsp. *herbichii* (Wol.) Soó — Annual, stems 10-30 cm, erect, simple or ramified, hirsute. **Seeds ellipsoid, dorsal side convex, ventral with shallow broad longitudinal furrow, apex slight apiculate, base with brown caruncle, 4.5-5 x 1.9-2.2 mm. Surface smooth, dull, blackish.** Native to central Europe, mountains spruce forests and dwarf pine stands of the subalpine zone. Pl, Ro, Sk, Uk.

**3203. *Melampyrum nemorosum*** L., *M. coerulescens* Gilib. — Annual, stems 15-50 cm high, erect, simple or ramified, hirsute or pubescent. **Seeds prolonged ellipsoid, dorsal side convex, ventral with deep longitudinal furrow, apex rounded, base with brownish caruncle, 4.5-5.2 x 1.8-2.2 mm. Surface smooth, dull, blackish to black. 2n = 18.** Native to Eurasia, light forests and shrubberies damp, muddy and peaty meadows and chalky slopes; throughout the Carpathians.

**3204. *Melampyrum pratense*** L., *M. vulgare* Hill, *M. vulgatum* Pers. — Annual, stems 10-60 cm, erect, simple or ramified, glabrous or pubescent. **Seeds narrow ovoid, dorsal side convex, smooth or longitudinal shallow furrowed, ventral side with broader and deeper furrow, apex rounded, base with whitish, later on brown caruncle, 4.2-4.8 x 1.6-1.8 mm. Surface slight lustrous, brownish-**

**black to black. 2n = 18.** Native to western Europe, mostly high forest, shrubberies, peatbogs, dwarf pine stands; throughout the Carpathians.

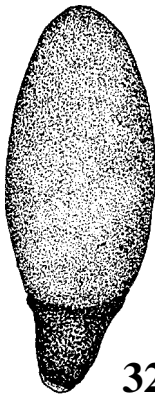
**3205. *Melampyrum sylvaticum*** L., *M. alpestre* Pers., *M. carpaticum* Schult. — Annual, stems 10-40 cm high, simple or ramified, erect, pubescent or glabrous. **Seeds prolonged ovoid or ellipsoid, dorsal side convex with shallow and short furrowlets, ventral side with one deep and long furrow, apex rounded or slight apiculate, base with whitish, later on brown caruncle, 5.5-6.5 x 1.6-2 mm. Surface dull, brownish-black to black. 2n = 18.** Native to Europe, woodlands, shrubberies, river-banks, forest and damp meadows; in all Carpathian territories.

**3206. *Tozzia carpatica*** Wol., *T. alpina* subsp. *carpatica* (Wol.) Hayek — Perennial, semiparasitic, stems erect, up to 50 cm high, 4-angled, the angles usually hairy. **Fruits capsulas, globose, 1-seeded, base enclosed in a green envelope, 1.8-2.2 x 1.7-1.9 mm. Surface black. Seeds (downright) oval, smooth, in upper half of dorsal side with chalaza and whiptail, hilum with narrowed base, 0.9-1.1 x 0.6-0.7 mm. 2n = 20.** Native to the East Carpathians, shady, moist and stony places of the montane zone at altitudes about 1000 m and higher, calcicole. Pl, Ro, Sk, Uk.

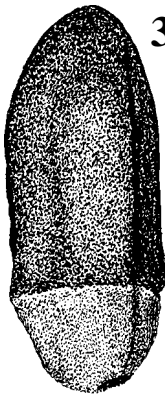
**3207. *Euphrasia nemorosa*** (Pers.) Wallr., *E. nitidula* Reuter, *E. officinalis* L. subsp. *nemorosa* (Pers.) Čelak. — Annual, stems rough, much ramified in the bottom half, 5-35 cm high. **Seeds ellipsoid, biconvex, with longitudinal white bows on a pale-brown basis, lateral edges with one broader white bow, 1.4-1.6 x 0.5-0.6 mm. Surface of the basis smooth, dull, white grooved. 2n = 44.** Native to Europe, dry meadows, pastures, heaths, forest edges and clearings. Pl.

**3208. *Euphrasia pectinata*** Ten. — Annual, stems erect, stiff, 10-40 cm, slightly reddish, simple or ramified below. **Seeds prolonged ellipsoid, dorsal side convex with 5-8 longitudinal white bows, lateral edges with one broader bow on pale-brown basis, ventral side flat or convex with 4-8 white bows, 1.3-1.5 x 0.5-0.6 mm. Surface of the basis smooth, dull. 2n = 44.** Native to Europe, grasslands, scrubs and open woodlands, dry meadows, desert grounds, karst rocks especially. Hu, Mo, Ro, Sk, Uk.

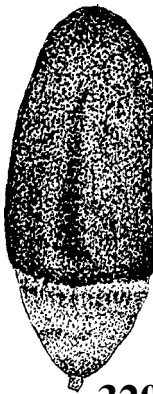
**3209. *Euphrasia picta*** Wimm., *E. versicolor* Kern. — Annual, stems erect or flexuous, 5-30 cm high,



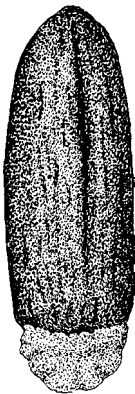
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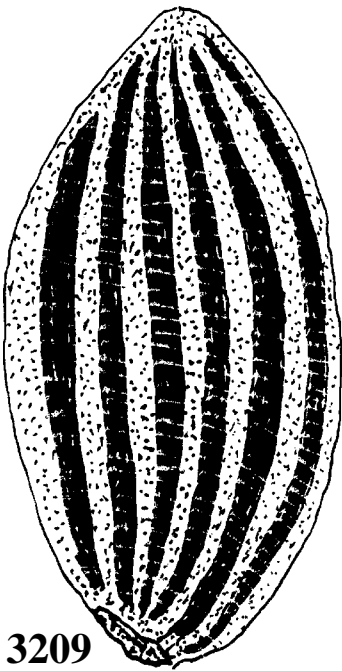
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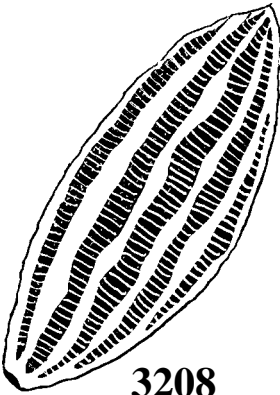
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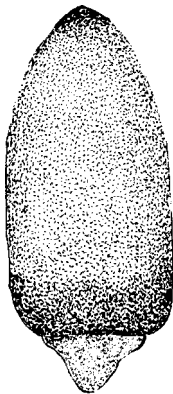
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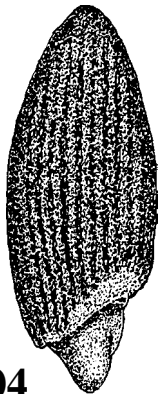
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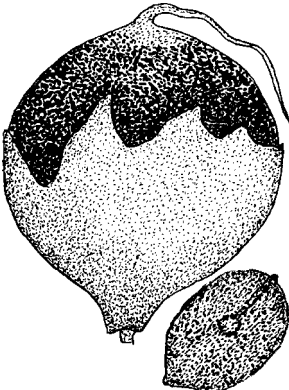
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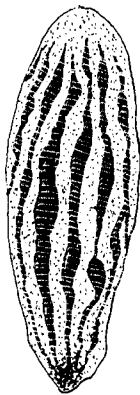
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curly, simple or little ramified. **Seeds ellipsoid, biconvex, both dorsal and ventral sides with 5 narrow white bows, the bows broader at lateral edges, 1.4-1.6 x 0.7-0.8 mm.** Surface of the seed corpus blackish, transversal fine white-grooved, dull, smooth. Native to the higher mountains of Europe, alpine meadows and pastures, slate and stony grounds, calcicole; throughout the Carpathians.

**3210. *Euphrasia rostkoviana*** Hayne, *E. pratensis* Fr. — Annual, stems erect or ascendent, 10-30 cm high, simple or ramified, downy. **Seeds ovoid to ellipsoid, biconvex with 10-14 narrower white bows and one lateral broader bow, 1.2-1.5 x 0.5-0.6 mm.** Surface of the seed corpus dull, smooth, blackish or black, transversal fine white-grooved. **2n = 22.** Native to Euro-Siberia, semidry meadows and grassy places of the woods and streams, calcifuge, from lowland up to alpine zones; in the whole Carpathians.

**3211. *Euphrasia salisburgensis*** Funck ex Hoppe, *E. alpina* Zapal. — Annual, stems erect, 3-20 cm high, pubescent, ramified from below. **Seeds prolonged ellipsoid, narrowed at both ends, biconvex, both sides with 4-6 narrow, longitudinal white bows, one lateral edge with a broader bow, 1.7-1.9 x 0.5-0.6 mm.** Surface of the seed corpus fine verrucose, black, transversal white-grooved. **2n = 44.** Native to Europe; alpine meadows, grassy rocks, scrubs, screes, usually on basic grounds. Pl, Ro, Sk, Uk.

**3212. *Euphrasia stricta*** D. Wolff ex J. F. Lehm., *E. ericetorum* Jord. — Annual, stems erect, 5-35 cm high, simple, downy, reddish. **Seeds obovoid, trigonous, with longitudinal white bows on smooth, pale-brown basis, at the ridge of the convex dorsal side and at lateral edges the bows are broader, apex rounded, base with hilum, 1.4-1.6 x 0.6-0.7 mm.** Surface of the basis fine white-grooved. **2n = 44.** Native to Europe, dry meadows, grasslands, scrubs, forest margins, shrubby slopes, boundaries, calcifuge. Mo, Pl, Ro, Sk, Uk.

**3213. *Euphrasia tatarica*** Fisch. ex Spreng., *E. puberula* Jord. — Annual, stems ramified above, seldom simple, 5-30 cm high, pubescent. **Seeds prolonged ellipsoid with 8-14 longitudinal white bows at pale-brown basis, dorsal side convex, ventral flat, lateral edges with broader bows, 1.3-1.5 x 0.5-0.6 mm.** Surface of the basis smooth, dull. **2n = 44.** Native to central Europe, dry grassy

and shrubby slopes, boundaries, grassy semisteppe meadows and forest steppes, vineyards. Hu, Ro, Sk.

**3214. *Euphrasia tatarae*** Wettst., *E. carpatica* auct. non Zapal., *E. minima* var. *tatarae* (Wettst.) Pawl. — Annual, stems 2-25 cm high, erect, simple or weakly ramified in upper part. **Seeds ellipsoid, biconvex, with 10-18 longitudinal whitish ribs, only one rib broader on ventral side, 1.8-2.2 x 0.6-0.8 mm.** Surface of the seed corpus dull, with fine transversal white groove. **2n = 44.** Native to southern and central Europe, subalpine and alpine pastures or stream-banks. Pl, Ro, Sk, Uk.

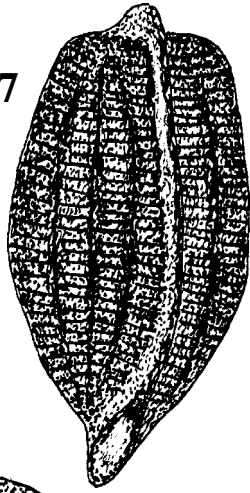
**3215. *Odontites vernus*** (Bellardi) Dumort., *O. pratensis* Borbás, *Euphrasia verna* Bellardi — Annual, hemiparasitic, downy or hirsute, stems erect or ascendent, 10-30 cm high, 4-angular, simple. **Seeds broadly oval, ovoid or spindleform, apex slight narrowed, rounded-off at base, 1.3-1.7 x 0.7-0.9 mm.** Surface longitudinal ribbed and transversal grooved, dull, whitish-brown. **2n = 40.** Native to Europe, fallows, fields, boundaries, embankments and roadsides. Hu, Mo, Pl, Ro, Sk, Uk.

**3216. *Odontites vulgaris*** Moench, *O. serotina* Dumort, *O. rubra* Pers. ex Besser — Annual, stems 15-50 cm high, shoots numerous, short, procumbent and ascendent. **Seeds ovoid to ellipsoid, apex narrowed and rounded, base slightly rounded and with hilum, 1.6-1.9 x 0.8-1 mm.** Surface longitudinal ribbed and transversal grooved, dull, dirty-whitish. **2n = 20.** Native to Eurasia, fallows, fields, waste grounds, pastures. Hu, Mo, Ro, Sk, Uk.

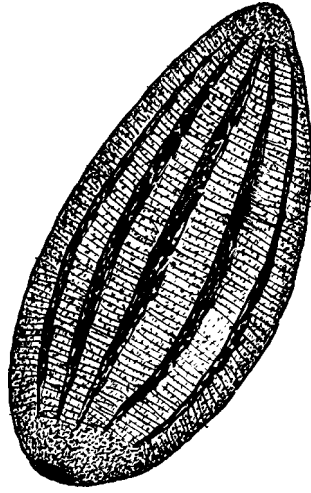
**3217. *Orphantha lutea*** (L.) A. Kern. ex Wettst., *Odontites lutea* (L.) Clairv. — Annual, hemiparasitic, downy, stems erect, 10-40 cm, shoots numerous, ascendent. **Seeds oval to ellipsoid, with raphe on ventral side, apex truncate with small beak, base narrowed with oval hilum, 1.4-1.7 x 0.7-0.8 mm.** Surface longitudinal ribbed and furrowed, dull, whitish or dark-brown. **2n = 20.** Native to Europe, sunny slopes, dry pastures, boundaries, overgrown rocks. Hu, Mo, Pl, Ro, Sk, Uk.

**3218. *Nemesia strumosa*** Benth. — Annual, stems 20-30 cm high, erect, branched above, flowers orange, red or scarlet. **Fruits capsulas, ± roundish with broad transparent wings, ± 2-2.3 mm in diam.** Surface with rich and motley structure, yellowish or brown. **Seeds oblong-obovoid, 1-1.5 x 0.5-0.7 mm.** Surface rough, with brick structure,

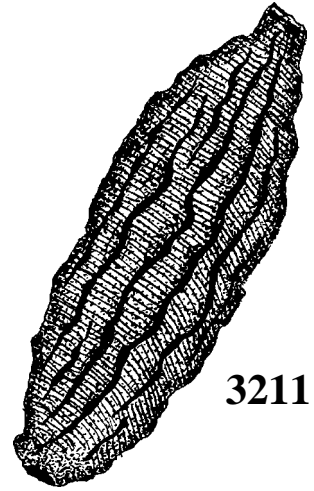
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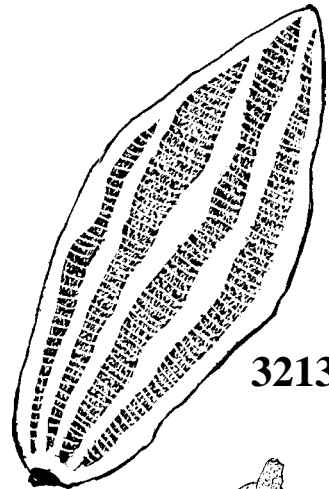
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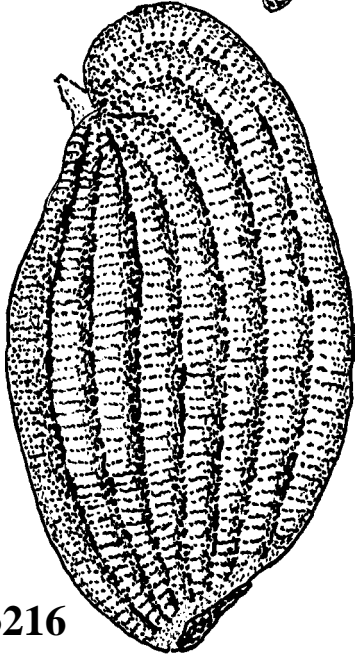
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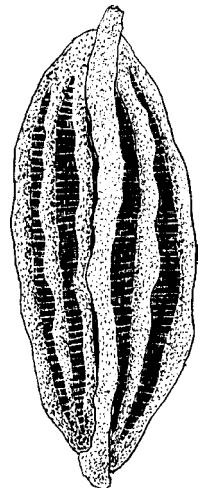
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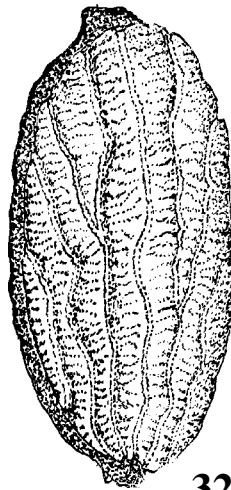
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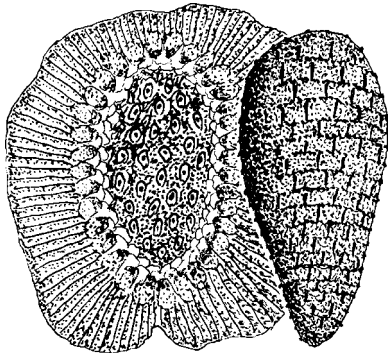
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3218



**dull, black.** Native to southern Africa; in the Carpathians rarely cultivated in flowerbeds or in flowerpots as a very nice summer flower, in some cvs.

**3219. *Bartsia alpina* L., *Rhinanthus alpinus* (L.) Lam., *R. montanus* Saut.** — Perennial, hemiparasitic glandular-hairy, stems erect or ascending, 10–40 cm high. **Seeds irregular shape, trigonous, reniform, cuneate, dorsal side convex with some longitudinal transversal grooved wings, ventral side acute, 1.8–2.2 x 1.1–1.3 mm. Surface slight lustrous, dirty-whitish to pale-brown. 2n = 12, 24, 36.** Native to Eurasia, alpine meadows, springheads, snow deck-chairs, rocky damp slits. Pl, Ro, Sk, Uk.

**3220. *Parentucelia latifolia* (L.) Caruel, *Euphrasia latifolia* L., *Bartsia latifolia* (L.) Sibth. et Sm.** — Annual, stems 10–30 cm high, erect or slightly ascending, often reddish or yellowish, mostly simple. **Seeds ellipsoid, apex and base rounded, 0.4–0.6 x 0.2–0.3 mm. Surface longitudinal fine verruculose, dull, light-brown.** Native to the western Mediterranean and Asia Minor, sandy banks, damp meadows, grassy and shrubby slopes; rarely hauling into the Carpathians.

**3221. *Parentucelia viscosa* (L.) Caruel, *Bartsia viscosa* L.** — Annual, stems 10–35 cm high, erect, simple or branched, glandular-hairy. **Seeds ellipsoid to reniform, slight compressed, apex rounded, base with hilum beak, 0.4–0.5 x 0.2–0.3 mm. Surface fine verruculose, slight lustrous, light reddish-brown. 2n = 48.** Native to southwestern Europe, wet places, meadows, sandy hills, scrubs; rarely hauling into the Carpathians.

**3222. *Pedicularis comosa* L., *P. coronensis* Schur** — Perennial, stem erect, 10–50 cm high, unramified, leafy. **Seeds ovoid to ellipsoid or trigonous, dorsal side convex or rooflike, ventral flat with or without furrow, apex rounded or bended, 2–2.5 x 1.1–1.3 mm. Surface longitudinal ribbed and pitted, dull, brown. 2n = 16.** Native to Eurasia, alpine meadows and stony hillsides, calcareous rocks. Ro, Sk, Uk.

**3223. *Pedicularis exaltata* (Bess. ex Benth.) Bunge, *P. transsilvanica* Schur, *P. foliosa* auct. non L.** — Perennial, stems 120–200 cm high, densely leafy, simple, erect, glabrous or pubescent. **Seeds obovoid to ellipsoid, base narrowed with hilum, 2.5–3 x 1.5–1.8 mm. Surface reticulate-foveate, dull or slight lustrous, light-terracotta.** Native to Eurasia,

semisteppe meadows, shrubby slopes and light forests. Pl, Ro, Uk.

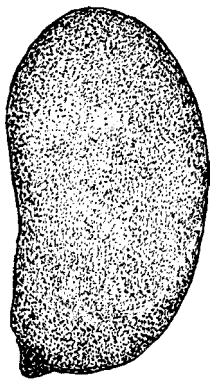
**3224. *Pedicularis hacquetii* Graf, *P. carpatica* (Andrae) Simonk.** — Perennial, stem erect, 30–120 cm high, glabrous or pubescent, angular, simple. **Seeds ellipsoid, trigonous, narrowed both ends, 3.1–3.5 x 1.4–1.7 mm. Surface reticulate, dull, pale-terracotta. 2n = 16.** Native to Eurasia, mountain meadows, wet shady stands in forests and dwarfpine areas, along brooks. Pl, Ro, Sk, Uk.

**3225. *Pedicularis kaufmannii* Pinzger** — Perennial, stems 10–80 cm high, erect, leaves oblong-ovate, all bracts leaf-like and exceeding the flowers. **Seeds oblong-oval or ovate, ± planoconvex, with deep furrow on ventral side, 2–2.5 x 1.1–1.3 mm. Surface longitudinal foveate and ribbed, dull, greyish-brown.** Native to southern and central-eastern Europe, on meadows, steppes and thickets. Br, Mo, Pl, Uk.

**3226. *Pedicularis oederi* Vahl, *P. versicolor* Wahlenb.** — Perennial, up to 4–15 cm, erect, unramified, glabrous below, hairy above. **Seeds prolonged obovoid to ellipsoid, dorsal side convex, ventral flat with deep longitudinal furrow, apex narrowed and rounded, base slight truncate with hilum beak, 2.5–3 x 1.1–1.4 mm. Surface longitudinal foveate or dense ribbed, dull, yellowish to dark-brown. 2n = 16.** Native to Eurasia, arctic-alpine element of damp grassy meadows, rocky slits, screes, stony slopes. Pl, Ro, Sk, Uk.

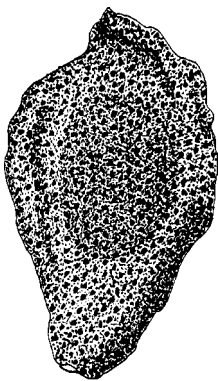
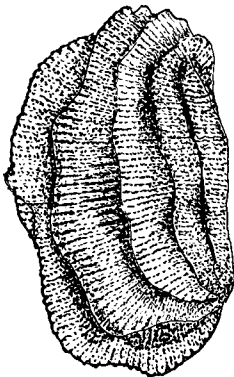
**3227. *Pedicularis palustris* L.** — Annual or biennial, stems erect, densely leafy, 5–70 cm high, glabrous or sparsely hairy. **Seeds pyriform, ovoid to ellipsoid, slight compressed, dorsal side convex, sometimes flat or concave, ventral side flat with deep longitudinal furrow, 1.9–2.2 x 1.2–1.4 mm. Surface reticulate, slightl lustrous, dark-brown. 2n = 16.** Native to Euro-Siberia and North America, damp meadows, fens, marshes, heaths, moorlands of montane and subalpine zones. Hu, Pl, Ro, Sk, Uk.

**3228. *Pedicularis resupinata* L.** — Stems 30–60 cm high, erect, subglabrous, cauline leaves numerous, oblong-lanceolate, subcordate at base, crenate-serrate, hairy beneath. **Seeds oblong-ovoid or oval, ± planoconcave, with deep longitudinal furrow at ventral side, 2.4–2.6 x 1–1.2 mm. Surface longitudinal ribbed, dull, blackish-brown.** Native to Siberia and eastern Asia, in meadows and open woods; rarely hauling into the Carpathians. Br.

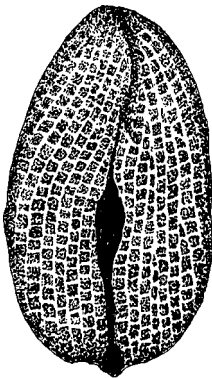


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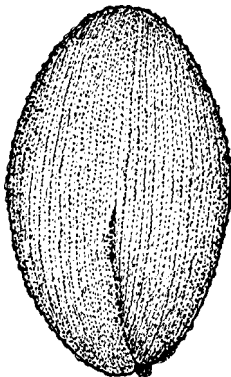


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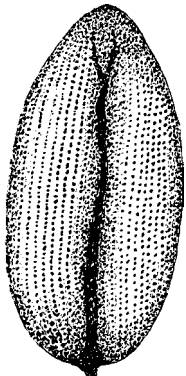
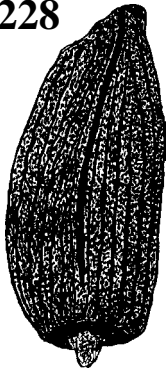


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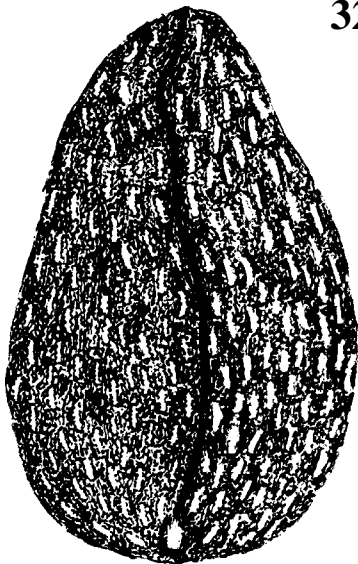
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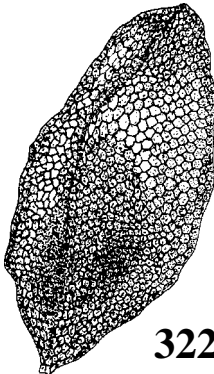
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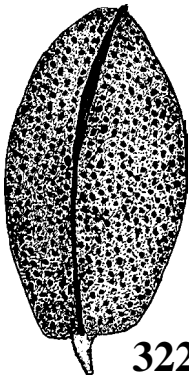
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**3229. *Pedicularis rostratocapitata*** Cr., *P. rostrata* L. p. p. — Perennial, stems erect, up to 25 cm high, hirsute, usually without leaves. **Seeds ovoid to ellipsoid, slight compressed, dorsal side convex, ventral slight flat with longitudinal furrow, apex narrowed, apiculate, base truncate, 2-2.4 x 1-1.2 mm. Surface foveolate in longitudinal rows, dull, light-brown.** Native to southern and western Europe, grassy, stony slopes, rocky slits of subalpine and alpine zones. Ro.

**3230. *Pedicularis sceptrum-carolinum*** L. — Perennial, stem stiffly erect, glabrous, angular, 20-100 cm high, often reddish. **Seeds globose-trigonus, compressed, biconvex, 2.8-3.2 x 1.8-2.1 mm. Surface reticulate, lustrous, pale-brown, seed inside darker. 2n = 32.** Native to central Europe, fens, wet woods and river-banks, meadows. Pl, Ro, Sk, Uk.

**3231. *Pedicularis sudetica*** Willd. — Perennial, stem shortly ascendent to erect, glabrous below, pubescent above, 10-25 cm high. **Seeds ellipsoid-trigonus, broadly winged with seed inside, apex truncate or rounded, base truncate with hilum, 2.9-3.3 x 1.8-2 mm. Surface membranous, reticulate, lustrous to glossy, brown. 2n = 16.** Native to arctic and subarctic Eurasia and North America, bogs, flushes and mossy tundra, springheads. Pl.

**3232. *Pedicularis sylvatica*** L. — Biennial to perennial, main stem erect, 5-25 cm high, lateral, stems ascending, often ramified. **Seeds ellipsoid, sometimes slight crooked, dorsal side convex, ventral flat with longitudinal furrow, 1.6-1.9 x 1-1.2 mm. Surface reticulate-foveate, dull, pale- to dark-brown. 2n = 16.** Native to Europe, bogs, heaths, moors and woods, damp meadows and pastures, peat-bogs. Br, Pl, Ro, Sk, Uk.

**3233. *Pedicularis verticillata*** L., *P. hirsuta* auct. non All. — Perennial, stems tufted, erect, 5-30 cm high, glabrous to crispate-hairy. **Seeds prolonged oval, slight compressed, dorsal side convex, ventral flat with deep furrow, apex narrowed to apiculate, base truncate with elaisome, 2-2.4 x 0.8-1 mm. Surface reticulate-foveate or dense ribbed, dull, blackish-brown. 2n = 12.** Native to central and southern Europe, damp alpine zone. Pl, Ro, Sk, Uk.

**3234. *Rhinanthus alectorolophus*** Pollich, *R. hirsutus* Lam. — Annual, stems 20-80 cm high, single or ramified, hirsute. **Seeds oval, irregular reniform**

**or ear-shaped, strong compressed, hilum covered with (c. 3 x 1 mm) leather-like layer, wingless or with 1 mm tick wing, 3.4-4 x 2.5-2.9 mm. Surface rough, dull, dark-grey, layer dirty-yellow. 2n = 22.** Native to central Europe, meadows, fields, cereals in particular, forest clearings. Hu, Mo, Pl, Ro, Sk, Uk.

**3235. *Rhinanthus glacialis*** Personnat, *R. angustifolius* C. C. Gmel. — Annual, stems 5-50 cm high, simple or ramified, glabrous, with black streaks. **Seeds oval, ear-shaped, strong compressed, hilum covered with leather-like layer, winged, 3.7-4.2 x 2.8-3.2 mm. Surface rough, longitudinal ribbed, slight lustrous, dark-brown, membranous wing yellowish-brown. 2n = 22.** Native to Europe, mountain meadows and pastures. Uk.

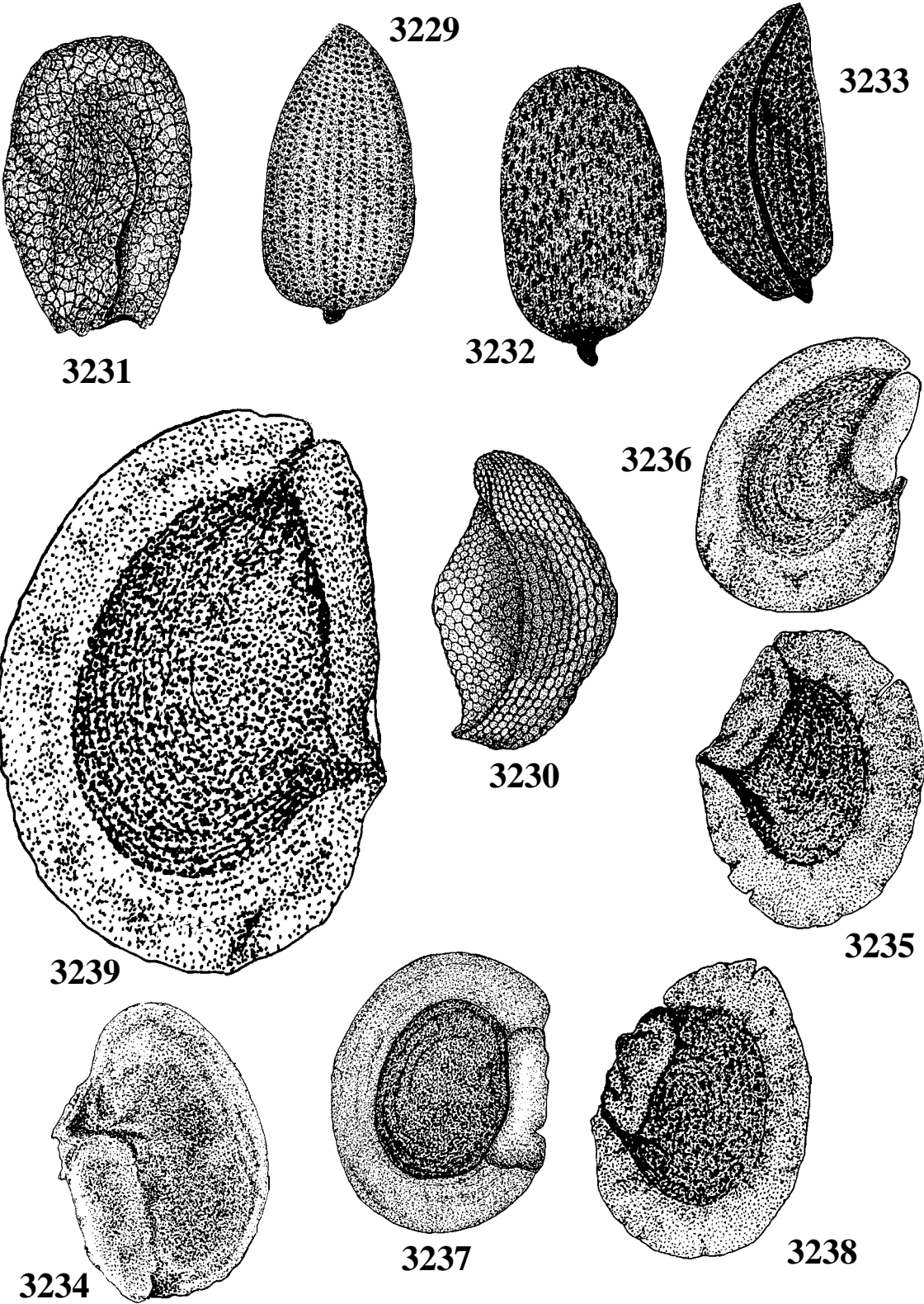
**3236. *Rhinanthus minor*** L., *R. crista-galli* auct. non L. — Annual, stems 5-50 cm high, with black lines, simple or ramified. **Seeds oval, subglobose or ear-shaped, strong compressed, hilum covered with c. 2 mm long layer, bordered with broad wing, 4-4.5 x 3-3.5 mm. Surface rough, dull, interrupted streaky, greyish-brown, wing light-brown to transparent. 2n = 22.** Native to Euro-Siberia, mountain meadows, semi-dry pastures, forest clearings, calcifuge; in all Carpathian regions.

**3237. *Rhinanthus pulcher*** Günther et Schummel ex Opiz, *R. alpinus* Baumg. — Annual, stems 10-50 cm high, simple or ramified, with black streaks. **Seeds reniform or ear-shaped, strong compressed, hilum covered with leather-like layer, broad winged, 5-5.6 x 4-4.5 mm. Surface rough, dull, greyish-brown, membranous wing yellowish-brown.** Native to southeastern and central Europe, mountain meadows, subalpine and alpine zones. Pl, Ro, Sk, Uk.

**3238. *Rhinanthus rumelicus*** Velen., *Alectorolophus rumelicus* (Velen.) Borbás — Annual, stem 40-60 cm high or ramified, glandular, hairy above. **Seeds subglobose, ear-shaped, reniform, strong compressed, hilum covered with leather-like layer, rest of seed face with broad membranous wing, 3.2-3.7 x 2.5-2.8 mm. Surface rough, dull, greyish- or dark-brown, wing yellowish-brown.** Native to southern Europe, sunny downs and wet meadows. Hu, Ro, Sk, Uk.

**3239. *Rhinanthus serotinus*** (Schönh.) Oborny, *R. major* Ehrh. non L., *R. angustifolius* auct. an C. C. Gmel — Annual, stems, up to 60 cm high, simple or branched, glabrous or moderately hairy with reddish





lines. **Seeds ovoid, ear-shaped, strong flattish, hilum covered with leather-like layer, rest of seed bordered with broad membranous wing, 4.5-5 x 3.2-3.8 mm. Surface rough, dull, greyish-brown, wing yellowish-brown.  $2n = 22$ .** Native to Euro-Siberia, meadows and pastures, coniferous woodlands, shrubberies on sandy grounds. Pl, Mo, Ro, Sk, Uk.

**3240. *Lathraea squamaria* L.** – Perennial, not green, yellowish, violet above, stems erect, 15-30 cm high, stout. **Seeds subspherical, irregular compressed, dorsal side convex, ventral mostly flat, 11-15 x 10-12 mm. Surface reticulate, rough, dull, dark-brown.  $2n = 36$ .** Native to Eurasia, humous deciduous woodlands in shady habitats, parasitic on roots of numerous coniferous and deciduous trees; in all Carpathian regions.

#### 145. OROBANCHACEAE

**3241. *Phelipanche arenaria* (Borkh.) Pomel, *Orobanche arenaria* Borkh.** – Perennial, stems 15-60 cm long, usually simple, glandular-hairy, with long appressed hairs. **Seeds oblong ovoid, apex roundish, bottom gradually narrowed, c. 0.4 x 0.2 mm. Surface reticulate-foveate.  $2n = 24$ .** Native to Europe, parasitic on *Artemisia* spp. and probably also on other herbs; in all Carpathian regions.

**3242. *Phelipanche purpurea* (Jacq.) Soják, *Orobanche purpurea* Jacq.** – Perennial, stems 15-60 cm high, slightly swollen at base, usually simple, whole plant minutely glandular-puberulent. **Seeds obovoid or ellipsoid, 0.45-0.55 x 0.3-0.35 mm. Surface reticulate-foveate, slight lustrous, dark-brown.  $2n = 24$ .** Parasitic on *Artemisia*, *Achillea* species, sunny, grassy slopes, dry meadows and pastures, from lowland up to montane zones; in all Carpathian regions.

**3243. *Phelipanche ramosa* (L.) Pomel, *Orobanche ramosa* L., *Kopsia ramosa* (L.) Dumort.** – Annual, stems 5-40 cm long, simple, often branched, leaves ovoid-lanceolate. **Seeds  $\pm$  ellipsoid to globular, c. 0.3 x 0.2 mm. Surface reticulate-foveate, lustreless, pale to dark-brown.  $2n = 24$ .** Native to Eurasia, Africa and North America, parasitic on many species of the families *Cannabaceae*, *Solanaceae*, *Asteraceae*, *Poaceae*, *Begoniaceae*, *Lamiaceae*, etc.; in all Carpathian regions.

**3244. *Orobanche alba* Stephan ex Willd., *O. epithymum* DC.** – Annual to perennial, stems up

to 50 cm long, slightly swollen at base, glandular-pubescent, often reddish. **Seeds mostly obovoid and ellipsoid, 0.3-0.4 x 0.2-0.25 mm. Surface glossy, reticulate-foveate, dark-brown.  $2n = 38$ .** Native to Eurasia, parasitic mainly on *Origanum vulgare*, rarely on *Thymus* spp. and others species of *Lamiaceae*, sunny calcareous and sandy places of uplands; in all Carpathian regions.

**3245. *Orobanche alsatica* Kirschl., *O. cervariae* Kirschl. ex Suard** – Perennial, stems 15-60 cm long, distinctly swollen at base, glandular-pubescent. **Seeds with a wide palette of shapes and sizes, 0.3-0.4 x 0.2-0.3 mm. Surface reticulate-foveate, glossy, dark-brown.** Native to Eurasia, parasitic on roots of *Apiaceae* (*Libanotis*, *Peucedanum*, *Hera-cleum*, *Aegopodium* etc.), stony slopes, shrubberies, forests, alpine meadows; in all Carpathian territories.

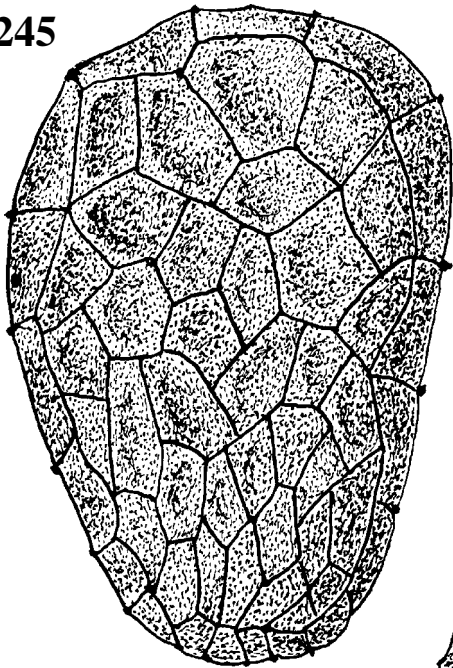
**3246. *Orobanche caryophyllacea* Sm., *O. vulgaris* Poir.** – Perennial, glandular-pubescent, stems 15-50 cm high, slightly swollen at base, yellowish or purplish. **Seeds with a wide range of shapes and sizes, mostly 0.3-0.4 x 0.2-0.3 mm. Surface reticulate-foveate, glossy, dark-brown.  $2n = 38$ .** Native to Europe, parasitic on the family *Rubiaceae*, especially on genera *Galium* and *Asperula*, mostly in uplands and warmer mountain areas, grassy slopes, shrubberies; throughout the Carpathians.

**3247. *Orobanche cernua* Loebl. subsp. *cumana* (Wallr.) Soó** – Annual to perennial, stems slightly swollen at base, yellowish, glandular-pubescent, up to 40 cm long. **Seeds obovoid to ellipsoid, subglobose, 0.4-0.5 x c. 0.2 mm. Surface reticulate-foveate, dull, dark-brown.  $2n = 38$ .** Originally growing in southern Eurasia, parasitic on various species of the families *Asteraceae* and *Solanaceae*, stony slopes, fields, gardens, waste places, roadsides and steppes. Hu, Ro, Sk, Uk.

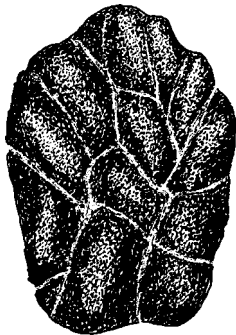
**3248. *Orobanche coerulescens* Stephan, *O. ammophila* C. A. Mey** – Perennial, stems 10-40 cm long, somewhat swollen at base, arachnoid-villous above, yellowish. **Seeds obovoid or ellipsoid, c. 0.4 x 0.3 mm. Surface reticulate-foveate, faint lustrous, dark-brown.  $2n = 38$ .** Native to Eurasia, parasitic on *Artemisia* spp., steppes, stony slopes on sandy soils. Hu, Mo, Pl, Ro, Sk, Uk.

**3249. *Orobanche crenata* Forskål, *O. speciosa* DC.** – Annual, stems up to 80 cm long, slightly swollen at base, sparsely villous, yellowish. **Seeds with a**

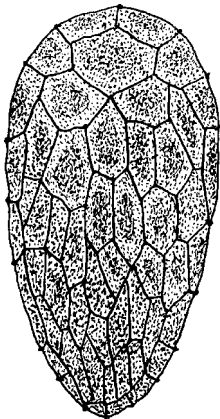
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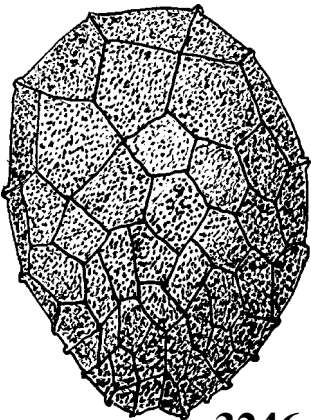
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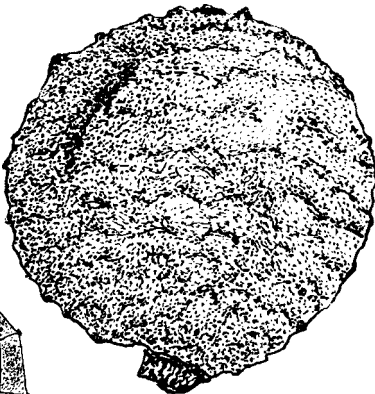
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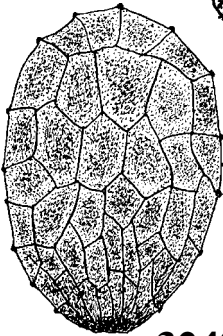
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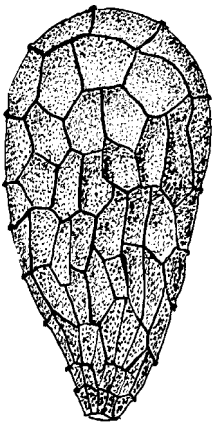
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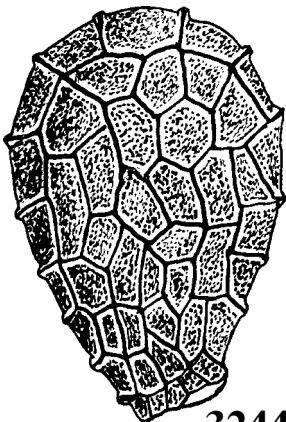
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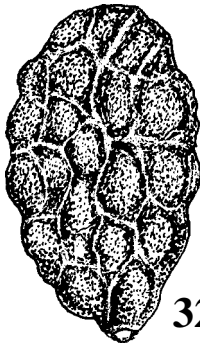
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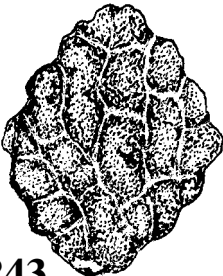
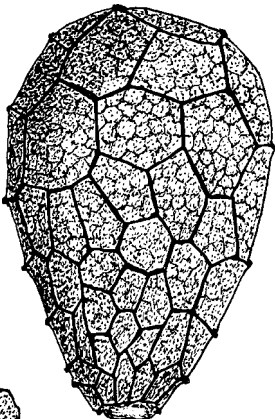
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very rich palette of shapes and sizes, mostly 0.3-0.4 x 0.2-0.3 mm. Surface reticulate-foveate, glossy, blackish-brown.  $2n = 38$ . Native to the Mediterranean, usually parasitic on *Fabacea* crops, in nature on stony slopes and mountain forests, shrubberies; rarely hauling into the Carpathians with leguminous seeds. Sk, Uk.

**3250. *Orobanche elatior*** Sutton, *O. major* L. p. p., *O. kochii* K. W. Schultz — Perennial, stems 20-70 cm long, slightly swollen at base, claviform, pinkish or brownish, glandular-pubescent. **Seeds mostly obovoid and ellipsoid, 0.4-0.5 x 0.2-0.3 mm. Surface lustrous, reticulate-foveate, dark-brown.  $2n = 38$ .** Native to Eurasia, parasitic on roots of various species of the families *Asteraceae*, *Dipsacaceae*, *Rubiaceae*, *Fabaceae*, *Liliaceae*, *Lamiaceae*, *Apiaceae* etc; throughout the Carpathians.

**3251. *Orobanche flava*** Mart. ex F. W. Schultz — Perennial, stem stiff, 20-65 cm long, sparsely swollen at base, yellowish or brownish, glandular-pubescent. **Seeds mostly ellipsoid or cylindric, 0.4-0.5 x 0.2-0.25 mm. Surface reticulate-foveate, glossy, dark-brown.  $2n = 38$ .** Native to Europe, parasitic on roots of the species *Petasites*, *Tussilago* and *Adenostyles* of the family *Cichoriaceae*, wet semishady habitats, near brooks and in shrubberies of the montane zone. Hu, Pl, Ro, Sk, Uk.

**3252. *Orobanche gracilis*** Sm., *O. cruenta* Bertol. — Perennial, stems 15-60 cm long, swollen at base, yellowish or reddish, glandular-pubescent. **Seeds obovoid to ellipsoid or of other shapes, 0.3-0.4 x 0.2-0.3 mm. Surface glossy, reticulate-foveate, dark-brown.  $2n = 38$ .** Native to Europe, parasitic on various *Fabaceae* (*Lotus*, *Trifolium*, *Onobrychis*, *Hippocrepis*, *Genista*, etc.), rarely on *Cistus* spp., stony and shrubby slopes and subalpine meadows. Hu, Mo, Pl, Ro, Sk, Uk.

**3253. *Orobanche hederæ*** Duby — Perennial, whole glandular-pubescent, stems 15-60 cm, yellowish to reddish, swollen at base. **Seeds obovoid, globose, ellipsoid, 0.35-0.4 x c. 0.3 mm. Surface reticulate-foveate, glossy, dark-brown to black.  $2n = 38$ .** Native to southern Europe, hauling into central Europe, parasitic on *Hedera*, *Fatsia* in parks, gardens and greenhouses. Hu.

**3254. *Orobanche loricata*** Rchb., *O. artemisiae* Vaucher — Perennial, stems 15-45 cm long, violet, rarely yellowish, faintly roughened at base, leaves

narrowly lanceolate, glandular-downy. **Seeds  $\pm$  ellipsoid, apex rounded, bottom  $\pm$  truncate, c. 0.3 x 0.2 mm. Surface reticulate-foveate, lustreless, brown.  $2n = 38$ .** Native to Europe, parasitic on the species of *Artemisia* and *Picris*, sunny stony slopes. Hu, Pl, Ro, Sk.

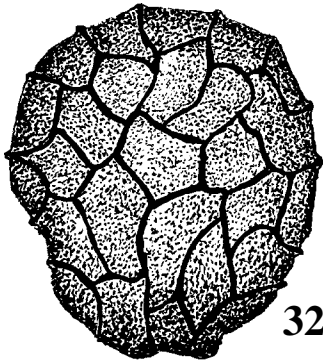
**3255. *Orobanche lucorum*** A. Braun — Perennial, stems 18-50 cm long, yellowish or pinkish, glandular-pubescent. **Seeds obovoid or of other various shapes, 0.3-0.4 x 0.2-0.3 mm. Surface glossy, reticulate-foveate, dark-brown.** Native to Europe, parasitic on *Berberis vulgaris*, *Rubus idaeus*, *Crataegus oxyacantha*, etc. Hu, Pl, Ro.

**3256. *Orobanche lutea*** Baumg., *O. medicaginis* Duby, *O. rubens* Wallr. — Perennial, stems 20-60 cm long, stiff, strongly swollen at base. **Seeds obovoid, ellipsoid, globular, c. 0.4 x 0.2 mm. Surface reticulate-foveate, glossy, dark-brown.  $2n = 38$ .** Native to Eurasia, parasitic on *Medicago* and *Trifolium*, and other species of *Fabaceae*, mountain meadows, grassy slopes on calcareous grounds. Hu, Mo, Pl, Ro, Sk, Uk.

**3257. *Orobanche minor*** J. E. Sm., *O. barbata* Poir., *O. apiculata* Wallr. — Annual to perennial, stems 10-70 cm long, non-bulbous at base, often in tufts, glandular-pubescent. **Seeds ellipsoid to globose, c. 0.3 x 0.2 mm. Surface reticulate-foveate, glossy, dark-brown.  $2n = 38$ .** Native to Eurasia, a parasite very dangerous to *Trifolium* spp., but also a wide variety of other genera, stony slopes, mountain meadows, shrubberies, orchards and parks; throughout the Carpathians.

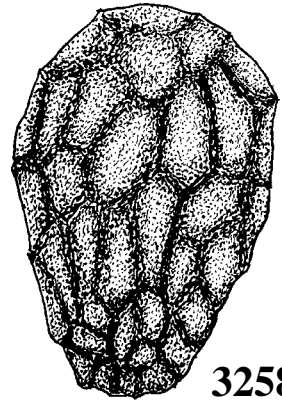
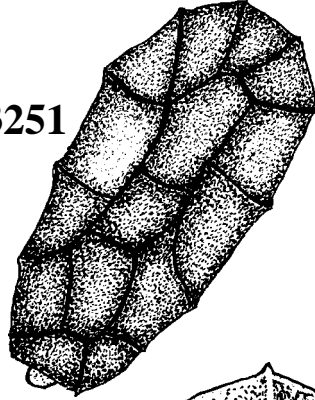
**3258. *Orobanche picridis*** F. W. Schultz, *O. loricata* var. *picridis* (F. W. Schultz) Beck — Perennial, stems 10-70 cm long, pale-yellow or violet, glandular-pubescent. **Seeds obovoid, ellipsoid, 0.3-0.4 x c. 0.25 mm. Surface reticulate-foveate, lustrous to glossy, dark-brown to black.  $2n = 38$ .** Native to southern Europe, parasitic on the species of *Asteraceae* and *Cichoriaceae* (especially on *Picris* spp.), meadows and sunny slopes, rare and scattered. Hu, Pl, Ro, Sk, Uk.

**3259. *Orobanche reticulata*** Wallr., *O. pallidiflora* Wimm. et Grab. — Perennial, stems up to 80 cm long, bulbous at base, glandular-pubescent. **Seeds with wide range of shapes and sizes, mostly 0.3-0.4 x 0.2-0.3 mm. Surface reticulate-foveate, glossy, dark-brown.  $2n = 38$ .** Native

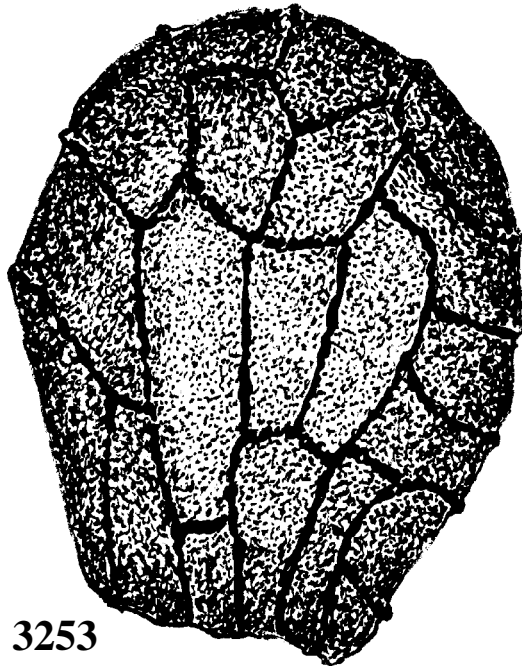


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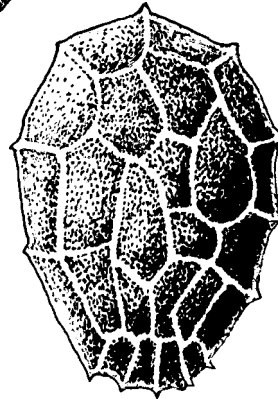
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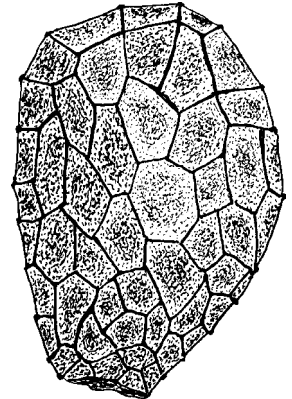
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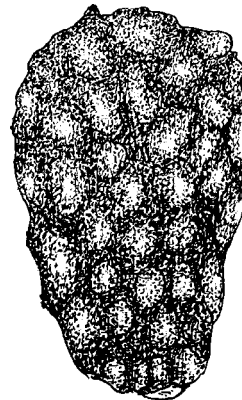
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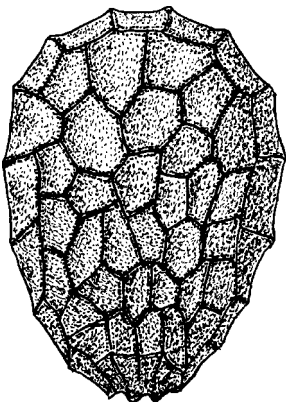
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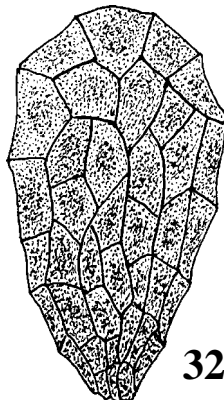
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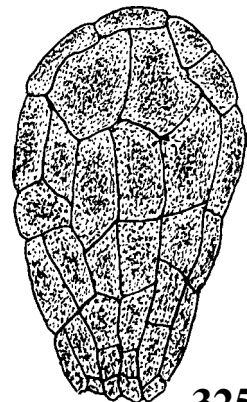
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to Eurasia, usually parasitic, on the species of *Cirsium*, *Carduus*, *Knautia* and related genera, especially in uplands at altitudes up to 2000 m of central and southern Europe, subalpine meadows, shrubberies and stony slopes; in all Carpathian territories.

**3260. *Orobanche teucrii*** Holandre, *O. atropurpurea* F. G. Schultz — Perennial, stems 10-40 cm long, weakly swollen at base, yellowish or reddish. **Seeds obovoid, spherical, oval, 0.35-0.45 x 0.25-0.3 mm. Surface reticulate-foveate, glossy, brown to blackish-brown.** Native to Europe, parasitic on *Thymus serpyllum* and *Teucrium* species, mostly on stony, sunny, dry, grassy and shrubby slopes from lowland up to submontane zones. Hu, Pl, Ro, Sk, Uk.

#### 146. GLOBULARIACEAE

**3261. *Globularia cordifolia*** L., *G. saxatilis* Salisb. — Dwarf shrubs with creeping woody stems rooting at the nodules, flowering stems 1-10 cm high. **Fruits achenes, elliptical, apex truncate with 5 deeply split teeth, base narrowed, 3.2-3.8 x 2.5-3 mm. Surface hairy. Seeds clavate, apex narrowed into the tip, base truncate with small hilum, 1.7-2 x 0.6-0.8 mm. Surface smooth, glabrous, dull or slight lustrous, dark-brown, with some longitudinal furrows. 2n = 32.** Native to mountain of Europe, rocky, sunny and calcareous slopes, humous, dryer and stony grounds. Hu, Sk.

**3262. *Globularia punctata*** Lapeyr., *G. elongata* Hegetschw., *G. wilkommii* Nyman — Perennial, stems erect, 10-30 cm high, unramified, densely leafy, with peak head. **Fruits achenes, elliptical, apex with 5 deeply split upstanding teeth, 3.5-4 x 2.3-2.7 mm. Surface hairy. Seeds clavate, apex narrowed into the tip, base truncate with small hilum, 1.5-1.8 x 0.5-0.7 mm. Surface smooth, glabrous, lustrous, brown to black, tip and bottom black. 2n = 16.** Native to Eurasia, on sunny, shrubby and grassy slopes, dry meadows on stony and sandy soils. Au, Hu, Ro, Sk.

#### 147. UTRICULARIACEAE

**3263. *Utricularia vulgaris*** L., *U. major* St. Lager — Perennial, an insectivorous, free-floating water plant, stems slender, up to 100 cm long, ramified, without roots. **Seeds rhomboidal or five- to six-angular, flat-tish, apex slight convex with small ring on the top, ventral side concave, 0.4-0.8 x 0.3-0.7 x 0.2-0.3 mm.**

**Surface fine rugose-tuberculate, slight lustrous, brown. 2n = 36, 40.** Native to Eurasia, in stagnant, shallow, nutrient-rich, calcifuge waters with muddy bottoms, in warm areas; in all Carpathian regions.

**3264. *Pinguicula alpina*** L., *P. flavescens* Flörke — Perennial, stems 5-15 cm high, with a basal leaf rosette. **Seeds cylindric with more or less crooked apex, 0.7-0.9 x 0.2-0.25 mm. Surface reticulate-foveate, slight lustrous, reddish-brown. 2n = 32.** Native to Eurasia, peatbogs, wet heaths and rocks, springheads, from subalpine to alpine zone, in peaty, calcareous soils with water trickling through it, insectivorous plant. Hu, Pl, Ro, Sk, Uk.

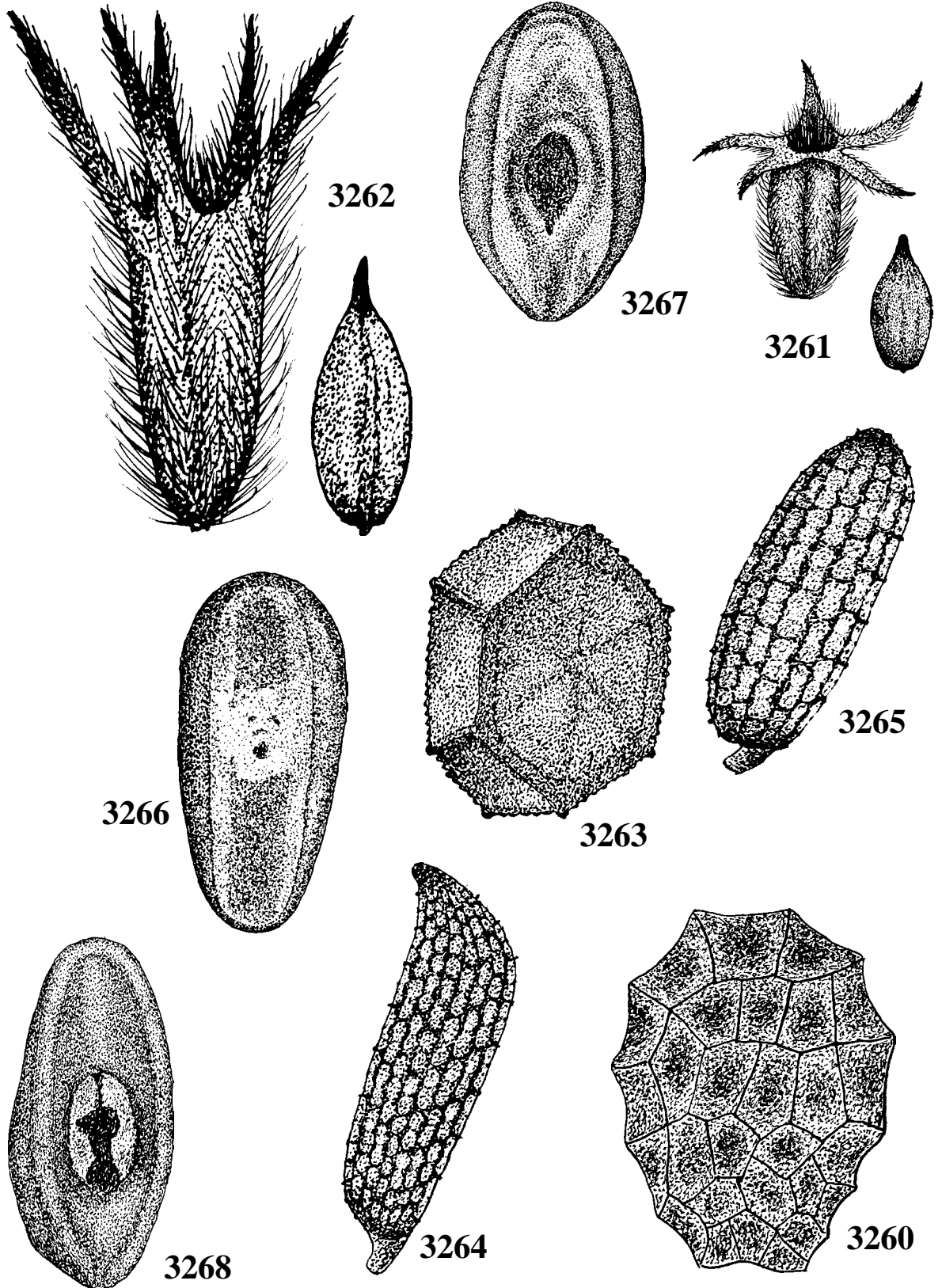
**3265. *Pinguicula vulgaris*** L. — Perennial, stems 5-10 cm high, with a basal rosette of leaves, and numerous short fibrous roots. **Seeds cylindric, straight, apex slight rounded, base narrowed into a short stalk, 0.7-1 x c. 0.3 mm. Surface reticulate-foveate with large isodiametric cells, in transversal section angular, lustrous, brown. 2n = 64.** Native to Eurasia, common in wet heaths and bogs, rivulets, rocky mossy places in light *Pinus* forests, on serpentine and limestone, from lowlands up to subalpine habitats; an insectivorous plant occurring in all Carpathian regions.

#### 148. PLANTAGINACEAE

**3266. *Plantago afra*** L., *P. psyllum* L. p.p. — Annual, stems leafy, 10-40 cm high, glandularly downy above. **Seeds obpyriform to ellipsoid, dorsal side convex, ventral concave with oval hilum and inside-bended margin, 2.8-3.2 x 1.1-1.3 mm. Surface glossy, rugose, reddish-brown. 2n = 12.** Originally growing in the Mediterranean, in dry places; rarely hauling into the Carpathians and naturalized there.

**3267. *Plantago altissima*** L. — Perennial, rhizome creeping, with several leaf rosettes, flower stalks 30-100 cm high. **Seeds prolonged ellipsoid, dorsal side convex with pale belt in the middle, ventral side concave with hilum and inside-bended margin, 3.2-3.7 x 1.4-1.8 mm. Surface lustrous, verruculose, brown. 2n = 72.** Native to Eurasia, wet and saline meadows. Hu, Mo, Ro, Sk, Uk.

**3268. *Plantago argentea*** Chaix, *P. rubens* Portenschl. — Perennial, rhizome short, leaf rosette, flower stalks erect, furrowed, 10-50 cm high. **Seeds ellipsoid, dorsal side convex, ventral concave with oval hilum and inside-bended margin, 3-3.3 x**



**1.3-1.5 mm. Surface verruculose, lustrous, brown to dark-brown.** Native to southern Europe, dry, grassy hill slopes of lowlands, usually calcicole. Hu, Ro.

**3269. *Plantago aristata*** Michx. — Annual, rhizome with basal leaf rosette, flower stalks erect, 10-20 cm high. **Seeds ellipsoid, dorsal side convex, ventral concave with two hilums and inside-bended margin, 2.8-3.2 x 1.4-1.6 mm. Surface rugose, slight lustrous, brown. 2n = 20.** Originally growing in North America, rarely hauling and naturalized. Sk.

**3270. *Plantago atrata*** Hoppe, *P. montana* Lam., *P. alpina* Vill. non L. — Perennial, rhizome with several leaf rosettes, flower stalks erect or ascendent, 5-20 cm high. **Seeds prolonged lanceolate, dorsal side convex, ventral concave with hilum and inside-bended margin, 3.2-3.8 x 1.6-1.8 mm. Surface strong wrinkly, dull, cinnamon-brown. 2n = 24.** Endemic to the Carpathians [subsp. *carpatica* (Pilger) Soó], grassy and stony mountain meadows on calcareous grounds. Pl, Ro, Sk, Uk.

**3271. *Plantago cornuti*** Gouan, *P. asiatica* auct. non L. — Perennial, plant 30-50 cm high, with succulent leaves, flower stalks erect. **Seeds ellipsoid, dorsal side convex, ventral side concave with oval hilum and slight inside-bended margin, narrow wing around border, 2.5-3 x 1.3-1.5 mm. Surface verruculose, lustrous, brown to blackish-brown, dorsal side pale black.** Native to central Europe, wet saline grounds, rare in littoral zones. Mo, Ro, Uk.

**3272. *Plantago coronopus*** L. — Annual to perennial, rhizome with several leaf rosettes, flower stalks numerous, 10-30 cm high. **Seeds elliptic or obovoid, dorsal side convex, transversal furrow in the middle, 1.1-1.3 x 0.6-0.8 mm. Surface rugose, brown. 2n = 10.** Native to coasts of Europe, common on sandy, saline soils near the seas. Pl, Ro, Uk.

**3273. *Plantago crassifolia*** Forskål — Perennial, with few rosettes, leaves linear, usually sparsely dentate, fleshy, glabrous or slightly hairy. **Seeds prolonged ellipsoid, dorsal side convex, ventral concave with white oval chalaza in the middle and marginal mound, 1.8-2 x 0.9-1.1 mm. Surface smooth, slight lustrous, dark-brown. 2n = 20.** Native to the Mediterranean region, saline habitats. Ro.

**3274. *Plantago holostium*** Scop., *P. recurvata* Bory — Perennial, rhizome with numerous leaf

rosettes, flower stalks numerous, 10-30 cm high. **Seeds cuneiform, biconvex or ventral side slight flattish, apex usually truncate, base with small winglet, hilum round or oval, 2.1-2.5 x 1.1-1.3 mm. Surface verruculose, dull, brown.** Native to southern Europe and Asia Minor, sunny places, calcareous grounds, in mountains, occurrence sporadic. Ro.

**3275. *Plantago lanceolata*** L., *P. elata* Schur, *P. crassipes* Borbás — Perennial, rhizome with numerous roots and several basal leaf rosettes, flower stalks 10-50 cm high. **Seeds prolonged oval to ellipsoid, dorsal side convex, ventral shallow scaled, with oval hilum and inside-bended margin, 2-2.6 x 1.1-1.3 mm. Surface lustrous to glossy, dark-brown. 2n = 12.** Cosmopolitan species growing from lowlands up to high mountains, meadows, pastures, slopes, fields and boundaries; in all Carpathians.

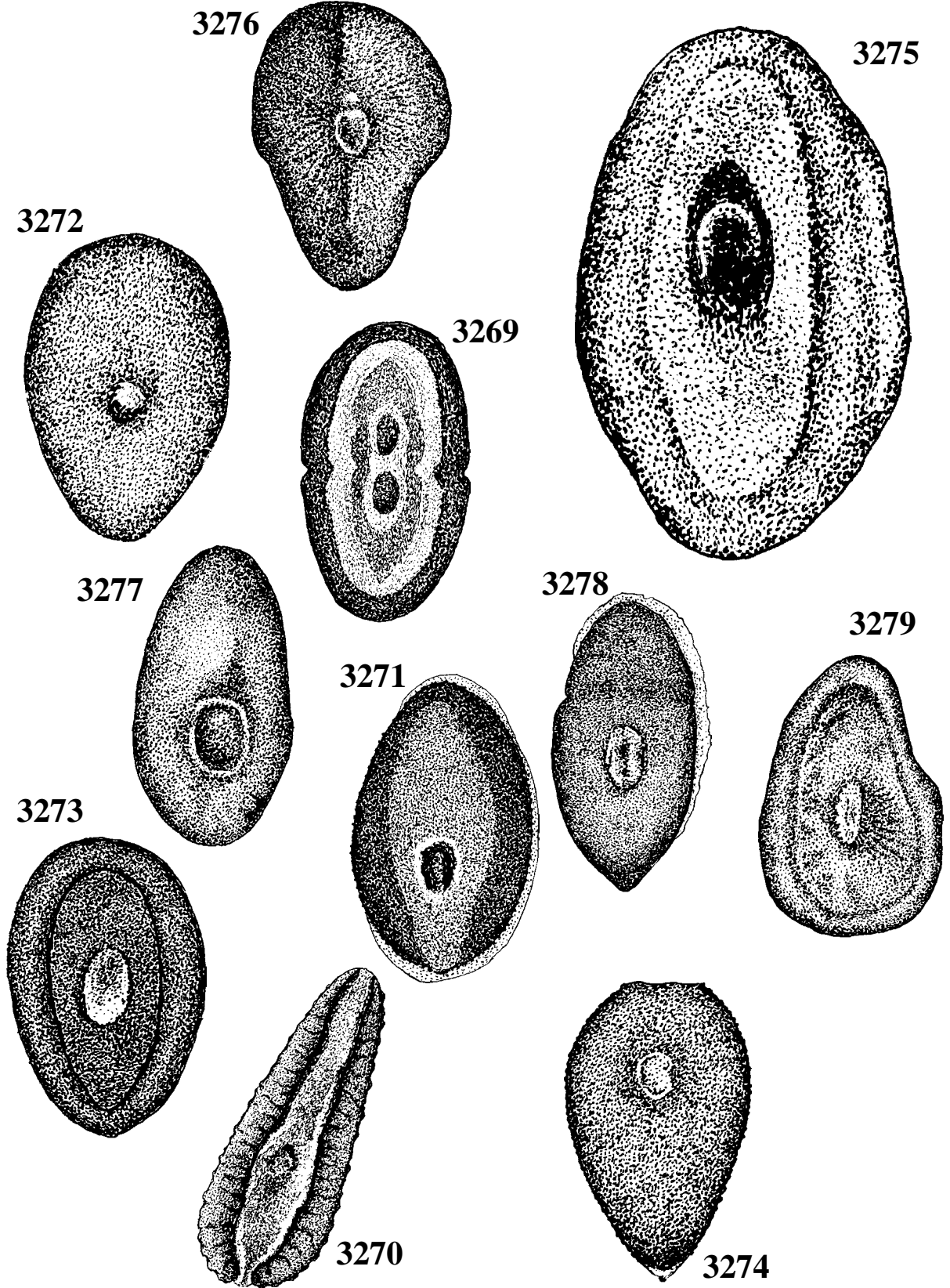
**3276. *Plantago major*** L., *P. latifolia* Salisb., *P. officinarum* Crantz — Perennial, rarely annual, plant 10-40 cm high, rhizome with one or more basal rosettes. **Seeds obpyriform, obovoid or trigonal, dorsal side flat or weak convex, ventral convex with whitish oval hilum in the centre, 1.2-1.6 x 0.7-0.9 mm. Surface radial shallow furrowed, dull or faint lustrous, dark-brown. 2n = 12.** Native to Eurasia, pastures, meadows, roadsides, boundaries, wastelands and sport's grounds, an old medicinal plant; now cosmopolite.

**3277. *Plantago maritima*** L., *P. salsa* Pall. — Perennial, rhizome ramified with several heads and leaf rosettes, flower stalks erect, 15-45 cm high. **Seeds prolonged ovoid or ellipsoid, dorsal side convex, ventral flattish with round hilum in the basal half, 1.7-2.1 x 0.8-1 mm. Surface dull, very fine tuberculate, with a transverse furrow in the middle, brown. 2n = 12.** Native to Eurasia, maritime habitats and saline or inland base-rich soils. Hu, Mo, Pl, Ro, Sk, Uk.

**3278. *Plantago maxima*** Juss. ex Jacq. — Perennial, plant up to 60 cm high with leaf rosette, flower stalks erect, hirsute. **Seeds ellipsoid, dorsal side convex, ventral slight concave or flattish, one part of border with transparent wing, 2.2-2.4 x 0.9-1.1 mm. Surface verruculose, lustrous, dark- to blackish-brown.** Native to southeastern Europe, wet grassy, usually saline grounds. Br Hu, Mo, Ro, Uk.

**3279. *Plantago media*** L., *P. concinna* Salisb. — Perennial, rhizome with one or several basal leaf





rosettes, flower stalks 10-40 cm high. **Seeds oval to ovoid, seldom irregular, dorsal side convex, ventral side concave with hilum in the centre and bended margin, 1.7-2.1 x 1-1.2 mm. Surface lustrous, verruculose, dark-brown.  $2n = 24$ .** Native to Eurasia, semidry turfs, meadows, pastures, paths, verges, sport's grounds, calcareous, nutrient-rich soils; common in all Carpathian territories.

**3280. *Plantago neumannii*** Opiz, *P. alpina* auct. — Perennial, stems 5-20 cm high, leaves linear-lanceolate, without veins, or only medial. **Seeds oblong-obovoid, dorsal side convex, ventral slight concave or flat with large hilum in upper part, 2.1-2.4 x 0.9-1.1 mm. Surface fine waved, lustrous, brown.** Native to the southeastern Europe, stony slopes of the montane zone. Uk.

**3281. *Plantago scabra*** Moench, *P. arenaria* Waldst. et Kit., *P. indica* L. — Perennial, stems densely leafy, 20-60 cm high, leaves narrowly lanceolate or linear. **Seeds oblong-obovoid, dorsal side convex with 2 darker stripes, ventral side concave, 2-2.2 x 1-1.1 mm. Surface glabrous, lustrous, brown.  $2n = 12$ .** Native to southern Europe, sandy places along roads, waste places. Mo, Ro, Uk.

**3282. *Plantago schwarzenbergiana*** Schur, *P. sibirica* auct. non Poir. — Perennial, plant with pulpy root, 12-25 cm high, with 1 to 8 erect flower stalks. **Seeds elliptic or irregular, dorsal side convex, ventral flat with large oval hilum and inside-bended margin, 1.2-1.5 x 0.5-0.7 mm. Surface verruculose, slight lustrous, brown.** Native to Europe, wet saline meadows. Hu, Ro, Uk.

**3283. *Plantago sempervirens*** Crantz, *P. suffruticosa* Lam. — Semishrub, 8-10 cm high, stems woody, ramified, downy. **Seeds cymbiform, ovate to oblong-lanceolate, dorsal side convex, ventral concave with oval hilum and inside-bended margin, 3.2-3.8 x 1.7-1.9 mm. Surface rugose, lustrous, pale- to dark-brown.  $2n = 12$ .** Native to southern Europe; rarely hauling into the Carpathians and naturalized there.

**3284. *Plantago stepposa*** Kuprian, *P. media* L. var. *urvilleana* Rapin — Perennial, flower stalks 20-70 cm high, basal leaf rosette with erect narrow leaves. **Seeds elliptic, dorsal side convex, ventral concave with oval hilum and inside-bended margin, 2-2.4 x 0.9-1 mm. Surface verruculose, blackish-brown, some seeds transparent winged at one end.** Native to

central and eastern Europe, steppes, steppe and saline meadows, fallows, forest margins. Hu, Mo, Uk.

**3285. *Plantago subulata*** L. — Perennial, with more rosettes, stems densely branched, rigid, trigonous along most of the lengs. **Seeds oblong-obovoid, dorsal side convex, distinct margin on concave ventral side, 3.5-3.9 x 1.7-1.9 mm. Surface glabrous, glossy, dark-brown.  $2n = 12$ .** Native to southern and southcentral Europe. Ro.

**3286. *Plantago tenuiflora*** Waldst. et Kit., *P. minor* Fries — Annual, plant 5-15 cm high, leaves in one rosette. **Seeds cuneiform or fusiform, sometimes bended or angular, dorsal side convex, ventral flattish with whitish hilum in upper half, 1.9-2.2 x 0.7-0.9 mm. Surface longitudinal furrowed, lustrous, dark-brown.  $2n = 24$ .** Native to Eurasia, usually in saline or strongly alkaline soils. Hu, Mo, Ro, Sk, Uk.

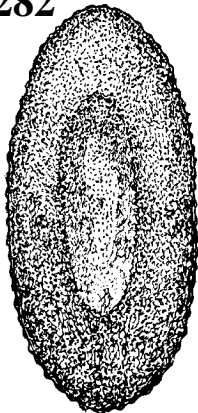
**3287. *Plantago uliginosa*** F. W. Schmidt, *P. intermedia* DC. — Perennial, similar to *P. major*, usually smaller. **Seeds irregular shaped, mostly ellipsoid, dorsal side flat or slight convex, ventral side convex with whitish hilum on the middle, 1-1.3 x 0.6-0.7 mm. Surface tuberculate, lustrous, reddish to dark-brown.  $2n = 12$ .** Native to Europe, on damp, especially saline habitats - meadows, fields, stripped pond margins.

**3288. *Littorella uniflora*** (L.) Aschers., *L. lacustris* L., *Plantago uniflora* L. — Perennial, small, bare plant, flower stalks up to 10 cm high. **Seeds ellipsoid, dorsal side transversal, humpy-wrinkly, apex narrowed with beak, base truncate, 2.3-2.7 x 0.9-1.1 mm. Surface brown.  $2n = 24$ .** Native to Europe, growing in dense colonies in shallow waters or on shores of lakes and ponds. Br, Pl, Ro, Uk.

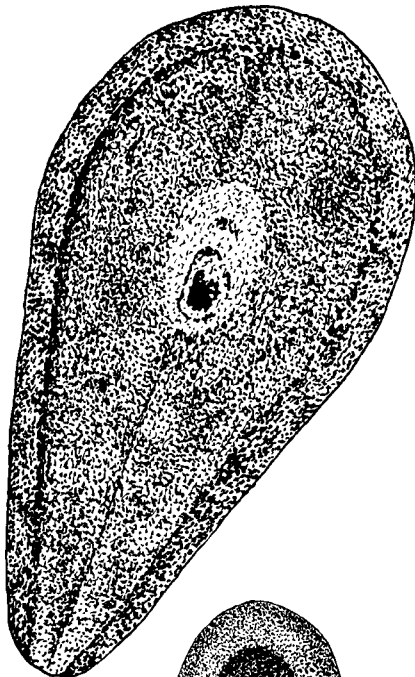
#### 149. GESNERIACEAE

**3289. *Haberlea rhodopensis*** Friv. — Perennial, relict of the tertiary, a minute plant c. 10-15 cm high, with basal rosette of evergreen leaves, hirsute on both sides, flowers light-violet. **Seeds spindleform, cylindric or sickle-shaped, transversal section oval or rounded, apex and bottom narrowed, 0.7-0.9 x 0.2-0.3 mm. Surface undulated, faint longitudinal furrowed, lustrous, yellowish-brown.  $2n = 38, 48$ .** Native to the Balkan mountains - Rhodopy; in the Carpathians rarely cultivated in rock-gardens or in flowerpots.

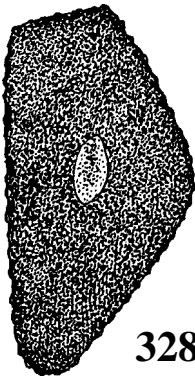
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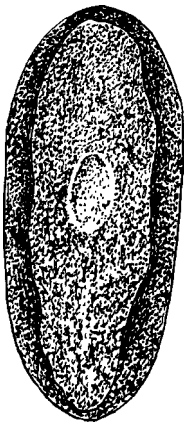
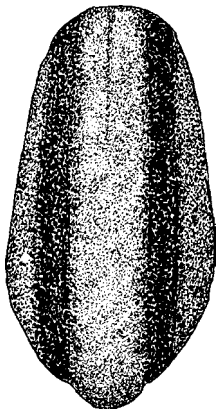
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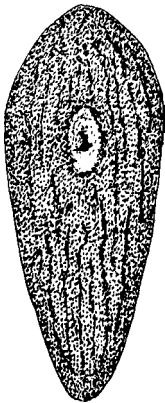
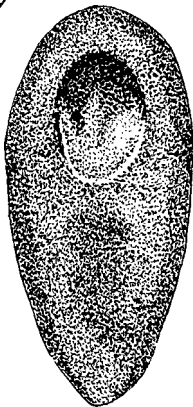


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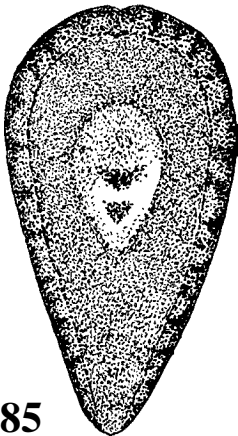


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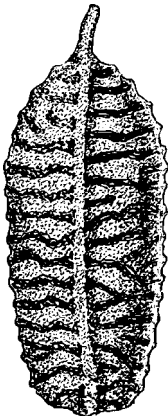
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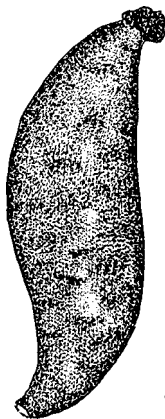
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## 150. CAMPANULACEAE

**3290. *Campanula abietina*** Griseb. et Schenk — Perennial, stems 15-40 cm high, bare, with thin, non-flowering shoots. **Seeds prolonged ellipsoid, biconvex, slight compressed, apex rounded, base slight truncate, 0.9-1.1 x 0.4-0.5 mm. Surface fine longitudinal ribbed and furrowed, lustrous, pale-brown, apex and bottom darker. 2n = 68, 80.** A Carpathian endemic of mountain forests, meadows and pastures in the alpine zone. Pl, Ro, Sk, Uk.

**3291. *Campanula alliariifolia*** Willd. — Perennial, stems erect, up to 70 cm high. **Seeds ellipsoid, strongly flattish, biconvex, narrow winged to some extent, 1.8-2.2 x 1-1.2 mm. Surface longitudinal fine ribbed and furrowed, lustrous, brown, wing light-brown. 2n = 34, 68, 96.** Originally growing in the Caucasus; in the Carpathians rarely cultivated as an ornamental in gardens, uniquely naturalized.

**3292. *Campanula alpina*** Jacq. — Perennial, stems erect, 10-30 cm high, mostly unramified, hirsute. **Seeds ovoid, ellipsoid or irregular, biconvex, lateral compressed, sometimes partly or around winged, 1.8-2.2 x 1.1-1.3 mm. Surface longitudinal faint ribbed and furrowed, lustrous, brown. 2n = 34.** Native to Europe (the Alps, the Carpathians and the Balkans), light woodlands, meadows of subalpine, alpine, rarely also mountain zones. Pl, Ro, Sk, Uk.

**3293. *Campanula altaica*** Ledeb., *C. stevenii* M. Bieb. subsp. *altaica* (Ledeb.) Fed. — Perennial, stems 20-40 cm, erect, simple or with few branches. **Seeds ellipsoid, lateral compressed, with narrow brim, 1-1.2 x 0.4-0.5 mm. Surface smooth, lustrous, pale-brown.** Native to southeastern Europe, steep slopes. Uk.

**3294. *Campanula barbata*** L. — Perennial, stems 10-40 cm high, single, erect, rarely scarce hirsute, leaves hairy on both sides. **Seeds ellipsoid, lateral strong flattish with narrow margin around, 0.9-1.1 x 0.5-0.7 mm. Surface very fine longitudinal furrowed, slight lustrous, pale-brown. 2n = 34.** Native to Europe, alpine meadows, non-calcareous, neutral, peaty stands. Pl.

**3295. *Campanula bononiensis*** L., *Campanula simplex* Lam. et DC. — Perennial, shortly hirsute, stems erect, 30-100 cm high, downy, mostly simple. **Seeds obovoid, ellipsoid or irregular shaped, flattish, biconvex, partly winged, 1-1.2 x 0.5-0.7 mm.**

**Surface longitudinal, fine furrowed, glossy, brown, wing pale. 2n = 34.** Native to Eurasia, shrubby and stony semisteppe slopes, sunny pastures, dryer meadows; in all Carpathian territories.

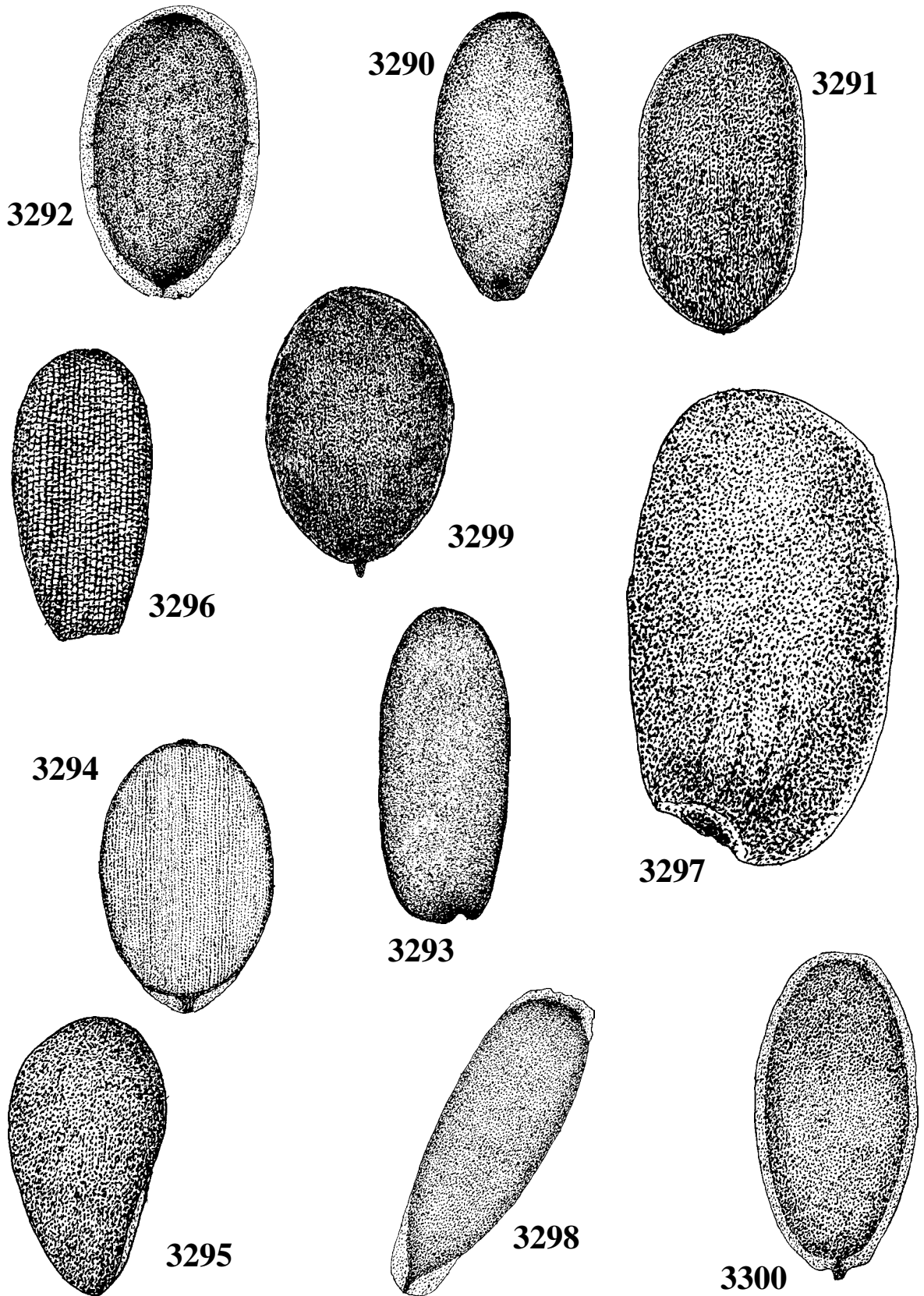
**3296. *Campanula carpatica*** Jacq., *C. reniformis* Schur — Perennial, stems sparsely tufted, ascendent, 10-50 cm long, poorly ramified, bare. **Seeds prolonged ellipsoid, slight flattish, biconvex, apex rounded, base truncate, 0.9-1.1 x 0.4-0.5 mm. Surface reticulate-foveate, lustrous, brown. 2n = 34.** Carpathian endemic of mountain, calcareous screes and rocky slopes. Hu, Pl, Ro, Sk, Uk.

**3297. *Campanula cervicaria*** L., *C. longifolia* Schloss. et Vuk. — Biennial (perennial), stems single, erect, 30-90 cm high, simple, grooved, angular, bristly hirsute. **Seeds ellipsoid with wide variability in shape and size, flattish, biconvex, apex and base truncate, partly winged, 1-1.3 x 0.5-0.7 mm. Surface longitudinal faint furrowed, brown, wing pale. 2n = 34.** Native to Eurasia, meadows, light shrubberies, woodlands margins and sunny grassy slopes. Hu, Pl, Ro, Sk, Uk.

**3298. *Campanula cochleariifolia*** Lam., *C. pusilla* Haenke — Perennial, stems ascendent or erect, simple, poorly ramified above. **Seeds prolonged ellipsoid, biconvex or ventral side slight flat, minute compressed, partly winged, 1-1.2 x 0.3-0.4 mm. Surface longitudinal fine furrowed, shiny, brown to dark-brown. 2n = 34.** Native to Europe (the Alps and Carpathians), rocks, screes, stony grounds, mainly in mountains, somewhat calcicole. Pl, Ro, Sk.

**3299. *Campanula garganica*** Ten. — Perennial, diffuse pubescent to subglabrous, stems 10-15 cm high. **Seeds ellipsoid, lateral compressed, with narrow undistinct brim, 0.6-0.7 x 0.4-0.5 mm. Surface very fine longitudinal furrowed, lustrous, pale- to dark-brown. 2n = 34.** Native to southern Europe (Italy, Greece), on shady rocks; in the Carpathians rarely cultivated for ornament in gardens.

**3300. *Campanula glomerata*** L., *C. aggregata* Willd. — Perennial, hirsute, downy, stems erect, 10-80 cm high, simple or ramified, indistinctly angular. **Seeds oblong to ellipsoid or irregular shaped, compressed, biconvex, base and apex rounded, 1.3-1.6 x 0.6-0.8 mm. Surface longitudinal fine furrowed, shiny, dark-brown. 2n = 30.** Native to Euro-Siberia, scrubs, forest margins, stony slopes, grassy semistepes, meadows and pastures, also culti-



vated as ornamental in gardens. Hu, Mo, Pl, Ro, Sk, Uk.

**3301. *Campanula grossekii*** Heuff. — Perennial, stems erect, 60-100 cm high, simple, rarely ramified, hirsute. **Seeds ellipsoid, biconvex, flattish, winged, 1.4-1.7 x 0.7-0.9 mm. Surface longitudinal fine furrowed, slight lustrous, brown.** Native to the Balkan Peninsula, rocky and stony places of upland woodlands. Ro.

**3302. *Campanula isophylla*** Moretti — Perennial, stems procumbent or pendulous, 10-20 cm long, flowers white and blue. **Seeds broad ellipsoid, biconvex, slight compressed, partly winged, 0.5-0.6 x c. 0.3 mm. Surface prolonged, fine furrowed, lustrous, brown. 2n = 32.** Originally growing in southern Italy, limestone rock-crevices; in the Carpathians commonly grown in windows and balconies (bridegroom and bride).

**3303. *Campanula kladniana*** (Schur) Witas., *C. polymorpha* Witas. — Perennial, stem solitary or ± in bunch, 10-30 cm high, erect, glabrous. **Seeds prolonged ellipsoid, dorsal side convex, ventral ± flattish, exceptional at base, 1-1.2 x 0.3-0.4 mm. Surface longitudinal fine furrowed, lustreless, brown.** Native to central Europe, rocky and steep slopes of montane and subalpine zones with calcareous grounds. Ro.

**3304. *Campanula latifolia*** L. — Perennial, stems erect, 50-100 cm high, unramified, bluntly angular, bare or downy. **Seeds obovoid, ellipsoid, compressed, biconvex, winged, 2-2.4 x 1.1-1.3 mm. Surface longitudinal fine furrowed, lustrous, pale-brown, wing light-brown. 2n = 34.** Native to Eurasia, lush meadows, humous mountain forests, scrubs, overgrown valleys, glacial plains and dwarfpine areas; in all Carpathian regions.

**3305. *Campanula lingulata*** Waldst. et Kit., *Mari-anthemum lingulatum* Schur — Biennial, stems erect or ascendent, simple, 20-40 cm high, leafed up to inflorescence. **Seeds ellipsoid with wing at margin, 1.1-1.3 x 0.7-0.8 mm. Surface longitudinal faint striate, lustrous, brown, wing pale. 2n = 34.** Native to Romania and the Balkan countries, sunny, arid slopes, shrubberies, usually on calcareous, dolomite grounds. Ro.

**3306. *Campanula macrostachya*** Waldst. et Kit. ex Willd., *C. multiflora* Waldst. et Kit. — Biennial, bristly

hirsute, stems erect, 30-90 cm high, rough sharply grooved. **Seeds oblong, ellipsoid, biconvex, bended, winged or wingless, 1.3-1.6 x 0.6-0.8 mm. Surface longitudinal fine furrowed, shiny, brown, wing pale. 2n = 16, 18.** Native to southern Europe (Balkan Peninsula), shrubby and stony slopes. Hu, Mo, Ro, Sk.

**3307. *Campanula medium*** L. — Annual, stems erect, 50-90 cm high, ramified, hirsute. **Seeds prolonged ovoid, ellipsoid, strong flattish, biconvex, partly winged, 1.7-2 x 0.9-1.1 mm. Surface longitudinal fine furrowed, brown, wing pale. 2n = 34.** Native to southwestern Europe; in the Carpathians often cultivated as ornamental in gardens, uniquely naturalized. Hu, Mo, Ro, Sk, Uk.

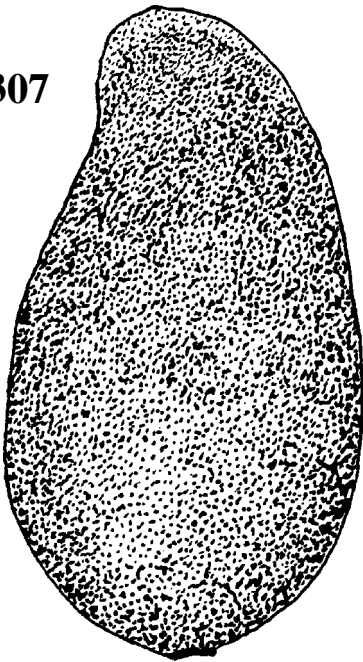
**3308. *Campanula moravica*** (Spitzner) Kovanda, *C. rotundifolia* L. var. *moravica* Spitzner — Perennial, stems 15-70 cm high, ascending, stiff, hairy below or glabrous, basal leaves cordate. **Seeds ellipsoid, lateral slight compressed, apex acute, bottom truncate, with or without narrow margin, 0.9-1.1 x c. 0.4 mm. Surface glabrous, lustrous, pale-brown. 2n = 68.** Native to the Carpathians and Pannonia, sunny steppes and sandbanks, rocks, stony places and dry pastures. Hu, Ro, Sk.

**3309. *Campanula patula*** L., *C. neglecta* Roem. et Schult. — Perennial, stems erect or shortly ascendent, angular, downy, 20-70 cm high. **Seeds ellipsoid to broad ellipsoid, biconvex, apex rounded, sometimes narrow winged, base ± truncate, 0.5-0.7 x 0.3-0.4 mm. Surface smooth or very fine reticulate-foveolate, glossy, light- to pale-brown. 2n = 20.** Native to Europe, meadows, shrubberies, light woodlands, forest margins and cut-over areas. Hu, Mo, Pl, Ro, Sk, Uk.

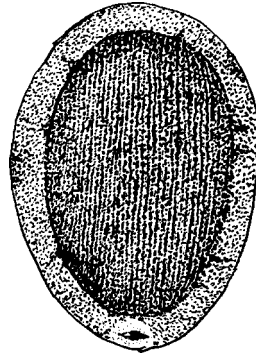
**3310. *Campanula persicifolia*** L., *C. speciosa* Gilib., *C. decurrens* L. — Perennial, bare, slender, stems erect, unramified, 50-120 cm high, sparsely leafy. **Seeds broad ellipsoid, slight compressed, dorsal side convex, lateral flattish, apex round, base truncate, shallow suture at margin, 0.7-0.9 x 0.4-0.6 mm. Surface smooth, strong shiny, brown. 2n = 16, 18.** Native to Eurasia, open woods and their margins, shrubby slopes, mountain meadows; in all Carpathian territories.

**3311. *Campanula portenschlagiana*** Roem. et Schult. — Perennial, densely and richly flowering tufts, stems procumbent with ascendent ends, 15-20 cm long, lax, numerous. **Seeds ellipsoid, biconvex,**

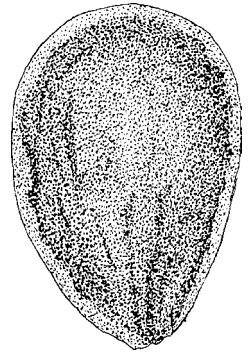
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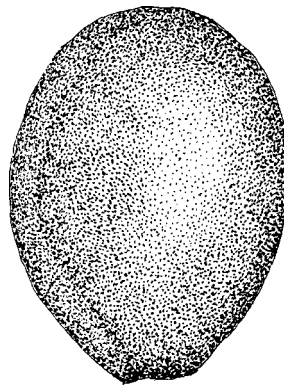
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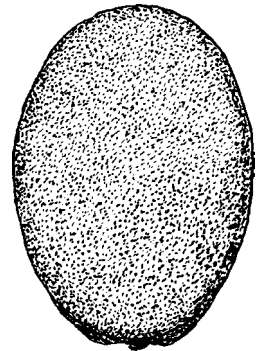
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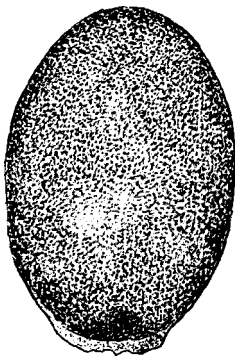
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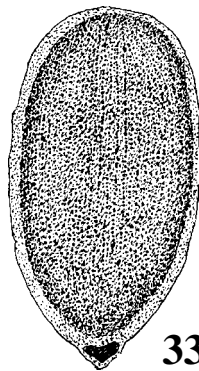
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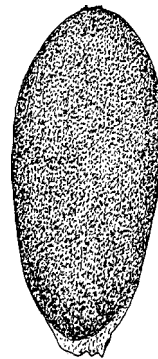
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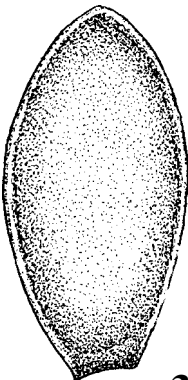
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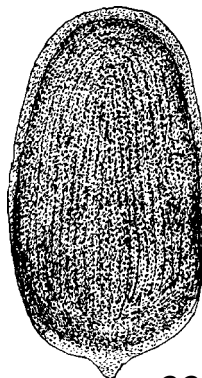
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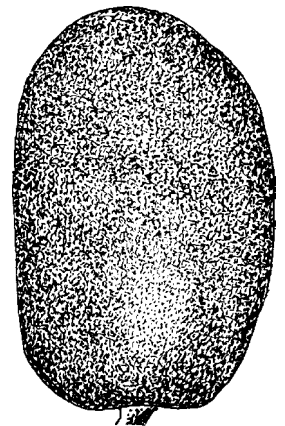
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3311



slight compressed, apex rounded, base truncate, 0.6-0.8 x 0.4-0.5 mm. Surface longitudinal fine furrowed, glossy, reddish-brown.  $2n = 34$ . Originally growing in Dalmatia, stony calcareous grounds; in the Carpathians commonly grown in rock-gardens.

**3312. *Campanula poscharskyana*** Degen — Perennial, sparsely pubescent, stems 15-25 cm high, lax, numerous, ascending, procumbent or pendent, much branched, flowers light-blue. **Seeds ellipsoid, lateral slight compressed, apex rounded, bottom truncate, 0.65-0.75 x 0.4-0.45 mm. Surface smooth, glossy, dark-brown.  $2n = 34$ .** Native to Dalmatia, on rocks and in stony places; in the Carpathians cultivated in gardens as an ornamental.

**3313. *Campanula rapunculoides*** L., *C. crenata* Link, *C. neglecta* Besser — Perennial, stems erect, simple, 30-100 cm high, bluntly angular, bare or hirsute. **Seeds oblong, ellipsoid, compressed, biconvex, winged, 1.8-2.1 x 0.9-1.1 mm. Surface longitudinal furrowed, lustrous, dark-brown, wing light-brown.  $2n = 102$ .** Native to Euro-Siberia, forest margins, fields, gardens, vineyards, fallows, shrubberies, waste places, overgrown rocks, from lowland up to montane zone; in all Carpathian regions.

**3314. *Campanula rapunculus*** L., *C. fastigiata* S. G. Gmel., *C. virgata* DC. — Biennial, stems erect, 30-100 cm high, angular, ramified above, bare or hirsute. **Seeds prolonged or broad ellipsoid, compressed, dorsal side convex, ventral  $\pm$  flattish, apex round, base truncate or round, 0.6-0.8 x 0.3-0.4 mm. Surface fine smooth, glabrous, light-brown, shiny.  $2n = 20$ .** Native to Eurasia, dry meadows, forest margins and clearings, shrubberies, waste places; in all Carpathian regions.

**3315. *Campanula rhomboidalis*** L. — Perennial, stems erect, 20-40 cm high, angular, bare or hirsute. **Seeds ellipsoid, biconvex, slight flattish, 0.9-1.1 x 0.4-0.5 mm. Surface longitudinal fine furrowed, lustrous, brown.  $2n = 34$ .** Originally growing in mountain meadows of the Alps, now and then cultivated as ornamental in gardens, mostly in rock gardens, uniquely naturalized.

**3316. *Campanula rotundifolia*** L., *C. filiformis* Gilib., *C. tenuifolia* Mart. — Perennial, stems shortly ascendent or erect, 30-70 cm, downy below, scarce leafy. **Seeds prolonged ellipsoid biconvex, slight compressed, 0.9-1.2 x 0.3-0.4 mm. Surface longitudinal fine furrowed, lustrous, brown, dark-brown**

**or black at both ends.  $2n = 34, 68, 102$ .** Native to Eurasia, dryer meadows, pastures, boundaries, light woodlands and shrubberies, rocky slopes from lowland up to montane zone; in all Carpathian territories.

**3317. *Campanula serrata*** (Kit. et Schult.) Hendrych, *C. napuligera* Schur — Perennial, stems erect, 10-40 cm high, angular, bare or hirsute. **Seeds prolonged ellipsoid, dorsal side convex, lateral  $\pm$  flattish, partly winged, but usually wingless, 0.9-1.1 x c. 0.4 mm. Surface longitudinal fine furrowed.  $2n = 34$ .** Native to the Carpathians, mountain pastures, grassy plains, forest clearings, stony and shrubby slopes. Pl, Ro.

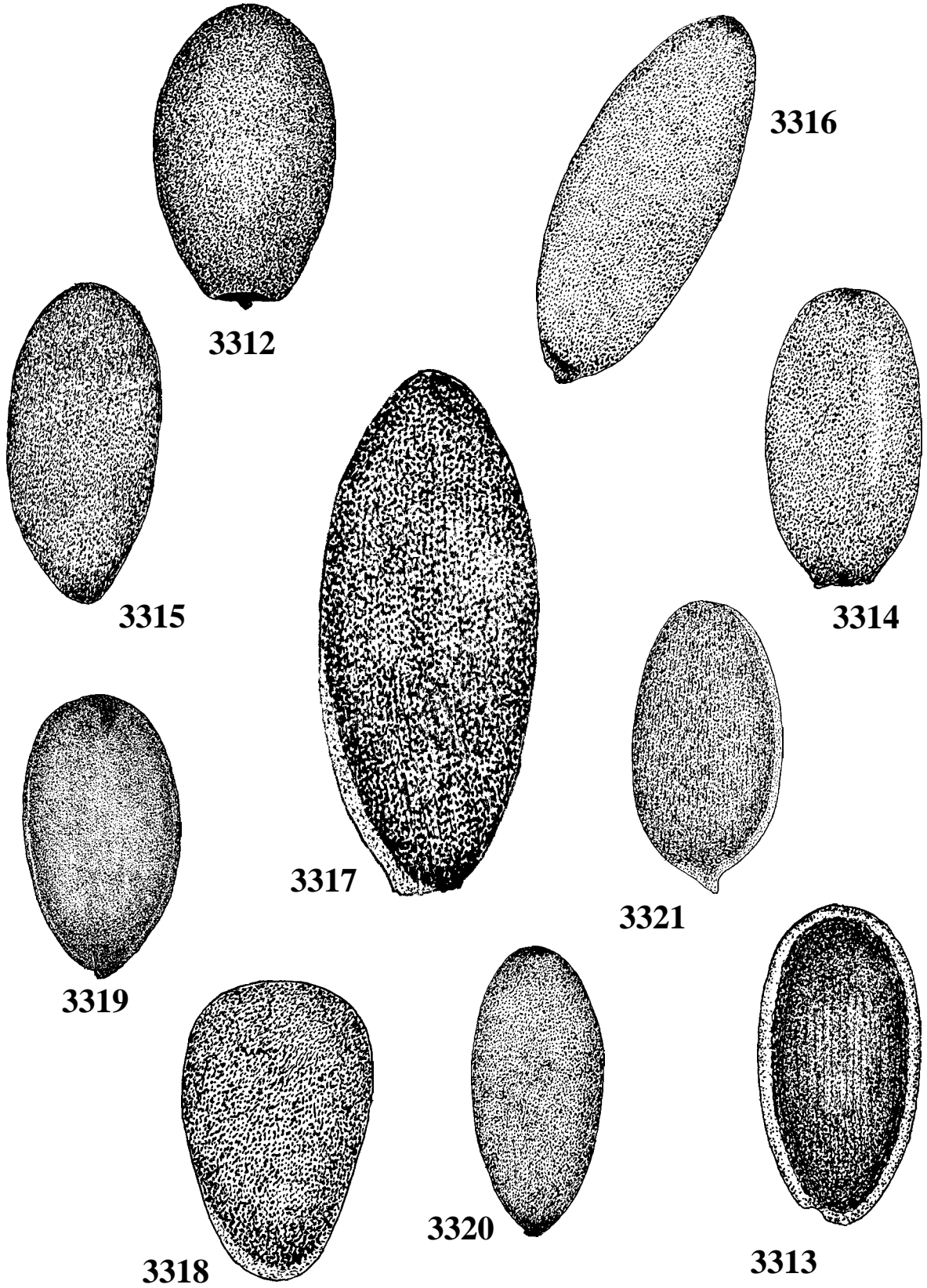
**3318. *Campanula sibirica*** L. — Biennial, hirsute, stems erect, 10-50 cm high, simple or ramified above, densely downy. **Seeds obovoid, ellipsoid, strong compressed, slight waved, apex truncate or round, partly winged, 1-1.2 x 0.6-0.7 mm. Surface longitudinal fine furrowed, glossy, dark reddish-brown.  $2n = 34$ .** Native to Euro-Siberia, sunny semisteppe and stony forest steppe, karst slopes, on limestone and dolomite; in all Carpathian territories.

**3319. *Campanula stevenii*** M. Bieb. — Perennial, stems 20-50 cm high, erect, simple or with few branches, usually 1 to 4-flowered in a lax inflorescence, corolla pale-blue. **Seeds ellipsoid, lateral compressed, with distinct hem at margin, 1.4-1.6 x 0.7-0.8 mm. Surface smooth, slight lustrous, brown.  $2n = 32$ .** Native to southeastern Europe, steppes and steppe slopes, Uk.

**3320. *Campanula tatrae*** Borbás, *C. scheuchzeri* auct. non Vill. subsp. *tatrae* — Perennial, stems ascendent, 5-20 long, downy below at angles. **Seeds ellipsoid, slight flattish, biconvex, 0.9-1.2 x 0.4-0.5 mm. Surface longitudinal fine furrowed, shiny, brown, apex and base darker.  $2n = 68$ .** Endemic to the West Carpathians, mountain meadows and plains. Pl, Sk.

**3321. *Campanula trachelium*** L., *C. urticifolia* Schmidt — Perennial, scarce bristly hirsute, stems erect, 30-100 cm high, mostly ramified, angular. **Seeds ovoid to ellipsoid, compressed, biconvex, partly winged, 1.3-1.6 x 0.6-0.8 mm. Surface longitudinal fine furrowed, shiny, brown, wing light-brown.  $2n = 34$ .** Native to Eurasia, woods and hedges, shrubberies, stony steppes, rather local on clayey soils; in all Carpathian regions.





**3322. *Adenophora liliifolia* (L.) Ledeb. ex A. DC., *Campanula liliifolia* L.** — Perennial, bare or downy, stems erect, 50-100 cm high, angular, densely leafy, ramified in inflorescence. **Seeds ellipsoid, biconvex, slight compressed, broad winged at one lateral edge, 1.8-2.2 x 0.9-1.1 mm. Surface longitudinal fine furrowed, lustrous, reddish-brown. 2n = 34.** Native to Eurasia, deciduous forests, shrubberies and damp meadows, often grown as an ornamental; in all Carpathian regions.

**3323. *Legousia hybrida* (L.) Delarbre** — Annual, stem shortly ramified from base, 10-30 cm high, shortly hirsute. **Seeds ovoid to broad ovoid or ellipsoid and globular, biconvex, slight compressed, 1.2-1.4 x 0.7-0.9 mm. Surface smooth, glossy, reddish-brown. 2n = 20.** Native to southern Europe, sometimes grown as an ornamental in gardens, uniquely naturalized. Pl, Ro, Uk.

**3324. *Legousia speculum-veneris* (L.) Chaix, *Specularid speculum-veneris* (L.) A. DC.** — Annual, downy, stems 10-40 cm high, richly ramified. **Seeds ellipsoid, biconvex, slight compressed, apex and base rounded, 1.2-1.5 x 0.6-0.8 mm. Surface smooth or faint longitudinal furrowed, glossy, reddish-brown. 2n = 20.** Originally growing in southwestern Europe, grown as an ornamental summer plant in gardens. Hu, Pl, Ro.

**3325. *Asyneuma canescens* (Waldst. et Kit.) Griseb. et Schenk, *Phyteuma canescens* Waldst. et Kit.** — Perennial, stems 30-100 cm high, erect, flowers in a long, paniculate clusters, capsule 5-6 mm long, ellipsoid. **Seeds ellipsoid, apex ± truncate, bottom slight narrowed, 1.5-1.7 x 0.7-0.9 mm. Surface glabrous, glossy, brown, with black bottom. 2n = 30, 32, 34.** Native to the northern Mediterranean lawns, rocky places, woodlands of upland and montane zones; in all Carpathian regions.

**3326. *Phyteuma orbiculare* L., *Ph. scheuchzeri* Baumg.** — Perennial, stems erect or shortly ascendent, 10-35 cm high, simple, scarce hirsute. **Seeds prolonged ellipsoid, slight flattish, biconvex, apex rounded, base truncate, 1.2-1.5 x 0.6-0.8 mm. Surface longitudinal faint furrowed, glabrous, lustrous, reddish-brown. 2n = 22.** Native to Europe, swampy meadows and black soils of lowlands, mountain meadows and rocks on hills, somewhat calcicole. Hu, Pl, Ro, Sk, Uk.

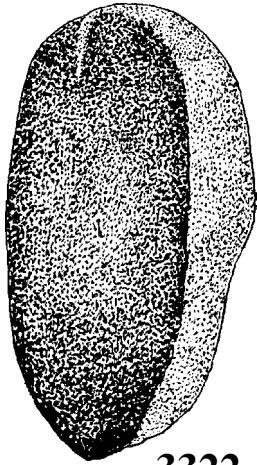
**3327. *Phyteuma scheuchzeri* All.** — Perennial, stems 12-45 cm high, erect or decumbent, glabrous, basal leaves, linear-lanceolate, truncate to cuneate at base, corolla deep-blue. **Seeds cylindric, lateral slight compressed, apex roundish, bottom truncate, 0.8-0.9 x 0.3-0.4 mm. Surface fine longitudinal furrowed, lustrous, brown. 2n = 36.** Native to the Alps and the North Apennines on rocky slopes, usually calcifuge; in the Carpathians cultivated as an ornamental, mostly in flowerpots, gardens and rock-gardens.

**3328. *Phyteuma spicatum* L., *Rapunculus spicatum* Baumg.** — Perennial, bare, stems erect, 30-100 cm high, simple, scarce leafy above. **Seeds ellipsoid, obovoid, slight flattish, biconvex, apex fine rounded, base truncate, sometimes with distinct or indistinct wing at one angle, 0.9-1.2 x 0.5-0.7 mm. Surface longitudinal faint furrowed, glossy, reddish-brown. 2n = 22.** Native to Europe, deciduous forests, shrubberies and mountain plains. Br, Hu, Pl, Ro, Sk, Uk.

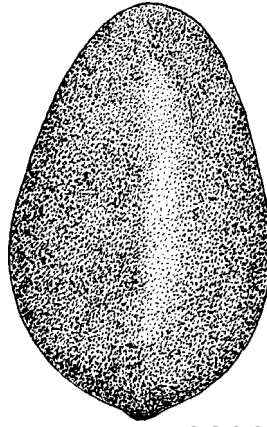
**3329. *Phyteuma tetramerum* Schur, *Ph. spicatum* Baumg.** — Perennial, stems simple, solitary, erect, 30-80 cm high. **Seeds ellipsoid or obovoid, compressed, biconvex, winged at one angle, 1.2-1.5 x 0.6-0.8 mm. Surface smooth or longitudinal faint furrowed, lustrous, dark-brown.** Native to the South-East Carpathians, mountain meadows, stony slopes, pastures and open woods of montane and subalpine zones. Hu, Pl, Ro, Uk.

**3330. *Phyteuma vagneri* A. Kern., *Ph. spiciforme* Roch, *Ph. atropurpureum* Schur** — Perennial, stems simple, erect, 15-50 cm high, glabrous. **Seeds ellipsoid or prolonged ovoid, compressed, biconvex, usually winged at one angle, 1-1.3 x 0.6-0.8 mm. Surface longitudinal faint furrowed, pale-brown.** Native to the Carpathians, subalpine and alpine pastures and other stony and grassy habitats. Ro, Uk.

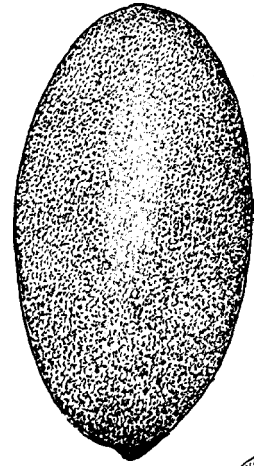
**3331. *Jasione heldreichii* Boiss. et Orph., *J. dentata* (DC.) Halácsy** — Perennial, stems slender, erect, simple or abundantly branched. **Seeds broad ellipsoid, dorsal side convex, rooflike, ventral ± flattish, 0.9-1.2 x 0.4-0.6 mm. Surface smooth or longitudinal faint furrowed, glossy, reddish-brown. 2n = 12.** Native to the Balkan Peninsula and Asia Minor, rocky stony, sunny grounds, usually in mountains. Ro.



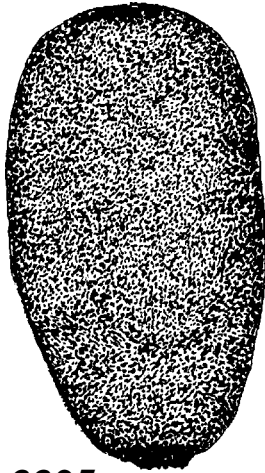
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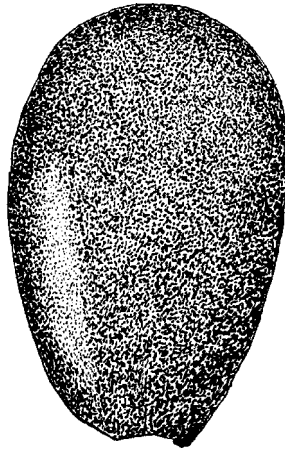
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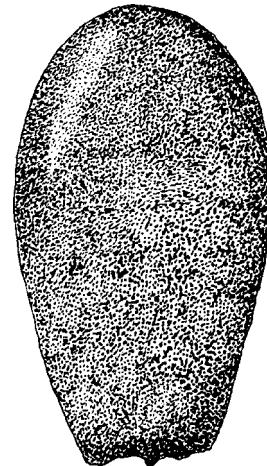
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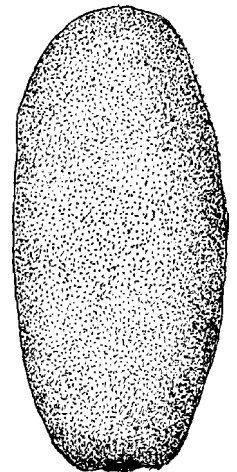
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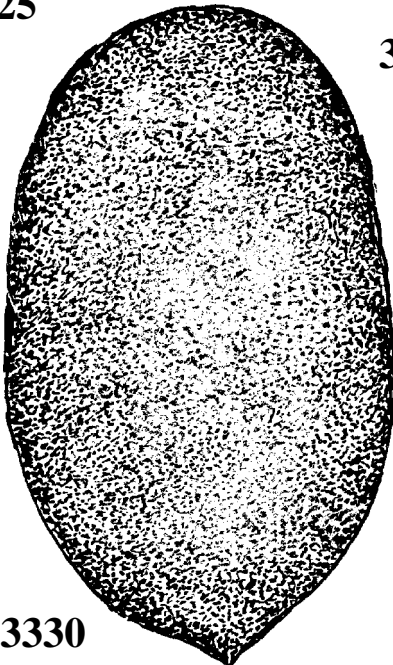
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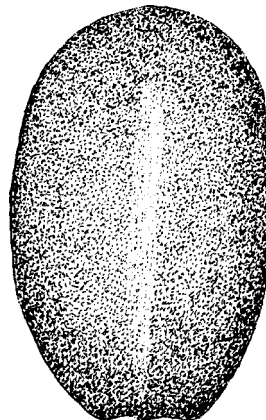
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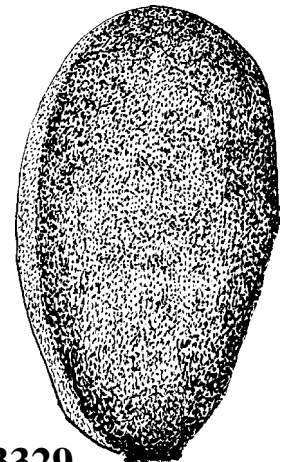
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**3332. *Jasione montana*** L. — Annual to biennial, hirsute, stems erect, simple or shortly patent-ramified, leafy only below. **Seeds ellipsoid, compressed, biconvex, apex and base rounded or  $\pm$  truncate, 0.6-0.8 x 0.2-0.3 mm. Surface smooth or longitudinal faint furrowed, glossy, brown.  $2n = 12$ .** Native to Europe, dry and sandy pastures, fallows, stony slopes, light scrubs, boundaries. Br, Hu, Pl, Ro, Sk, Uk.

**3333. *Symphandra wanneri*** (Roch.) Heuff., *Campanula wanneri* Roch. — Perennial, stems erect, 10-40 cm high, often ramified from base. **Seeds obovoid or ellipsoid, strong compressed, slight biconvex, whole margin or its part winged, 1.3-1.6 x 0.7-0.9 mm. Surface longitudinal faint furrowed, lustrous, pale- to dark-brown, margin pale.** Native to the Balkan Peninsula and western Asia, rock crevices and shady places of montane and subalpine zones; in the Carpathians cultivated in gardens for its big and nice flowers. Ro.

**3334. *Platycodon grandiflorum*** (Jacq.) A. DC., *Campanula grandiflora* Jacq. — Perennial, completely glabrous, stems erect, 30-90 cm high, cylindric, simple. **Seeds ellipsoid, slight flattish, biconvex, winged at one angle, or wingless, 2.2-2.5 x 1-1.2 mm. Surface smooth or longitudinal faint furrowed, lustrous, brown or black.** Native to eastern Siberia; in the Carpathians grown as an ornamental in gardens. Hu, Ro.

**3335. *Edraianthus kitaibelii*** A. DC., *E. graminifolius* (L.) subsp. *kitaibelii* A. DC. — Perennial, caespitose, stems numerous, ascendent or erect, 5-20 cm high, pubescent. **Seeds obovoid, ellipsoid, rectangular, flattish, 1.6-1.8 x 0.9-1.1 mm. Surface longitudinal faint furrowed, dull, brown to blackish-brown.  $2n = 32$ .** Native to the eastern Balkan Peninsula, steep rocks, stony and shady places, montane and subalpine zones. Ro.

**3336. *Edraianthus serpyllifolia*** (Vis.) A. DC. — Perennial, caespitose, stems 2-8 cm high, procumbent or ascending, sparsely leafy,  $\pm$  glabrous, simple. Corolla dark-violet. **Seeds ellipsoid, lateral strong compressed, with marginal wing, 1.7-2 x 1.1-1.3 mm. Surface longitudinal fine striate, lustrous, pale-brown, margin light-brown.** Native to western Yugoslavia and northern Albania; in the Carpathians rarely cultivated in gardens for ornament.

## 151. LOBELIACEAE

**3337. *Lobelia cardinalis*** L. — Perennial, plant 60-120 cm high, frutescent. **Seeds obovoid or ellipsoid, 0.9-1.1 x 0.4-0.5 mm. Surface with transparent excrescences and longitudinal minute furrows, lustrous, coffee-brown.** Native to North America; in the Carpathians cultivated as an ornamental or medicinal plant. Ro.

**3338. *Lobelia dortmanna*** L. — Perennial, water plant with numerous white, thin roots, and leaf rosettes. **Seeds obovoid or ellipsoid, base truncate with large hilum, 0.6-0.8 x 0.3-0.4 mm. Surface transversal wrinkly, dull or slight lustrous, brown.** Native to western and central Europe, in lakes, river gulfs and sandy river-beds. Br, Pl.

**3339. *Lobelia erinus*** L. — Annual to perennial, stems ascendent, 10-20 cm, glabrous, caespitose. **Seeds ellipsoid, biconvex, slight flatish, 0.5-0.6 x 0.3-0.4 mm. Surface smooth, glabrous, glossy, reddish-brown.  $2n = 28, 42$ .** Originally growing in southern Africa; often grown as an ornamental in gardens, uniquely naturalized. Hu, Mo, Ro, Sk, Uk.

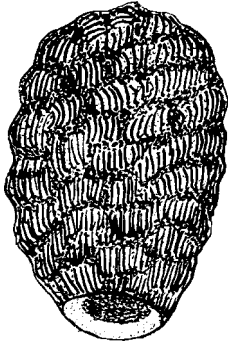
**3340. *Lobelia fulgens*** Willd. — Flowers, bracteoles and often also leaves reddish. **Seeds prolonged ellipsoid with 12-16 longitudinal undulated ribs, 0.8-1 x 0.3-0.4 mm. Surface dull, lustreless, reddish-brown.** Originally growing in North America, often cultivated as ornamental in gardens and parks.

**3341. *Lobelia inflata*** L. — Annual to biennial, stems 30-50 cm high, erect, hirsute. **Seeds ellipsoid, sometimes ovoid or obovoid, 0.7-0.9 x 0.3-0.5 mm. Surface reticulate-foveate, slight lustrous, light-brown to brown.** Originally growing in North America on boundaries, field margins and light forests, in Europe, inclusive the Carpathians, grown as an important antiasthmatic and antirheumatic medicinal plant, uniquely naturalized. Ro.

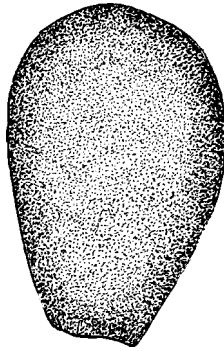
**3342. *Lobelia syphilitica*** L. — Perennial, stems 50-70 cm high, glabrous or  $\pm$  glandular. **Seeds ellipsoid, 0.7-0.8 x 0.3-0.4 mm. Surface reticulate-foveate, lustrous, yellowish or pale-brown.** Originally growing in North America, cultivated as an ornamental or medicinal plant in gardens. Ro.

## 152. ASTERACEAE

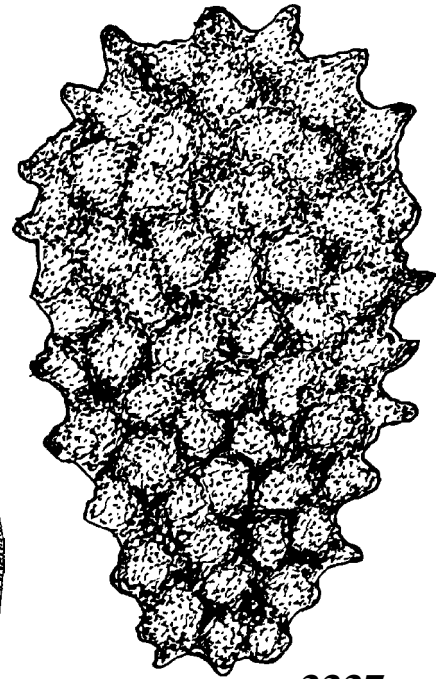
**3343. *Ageratum conyzoides*** L., *A. odoratum* hort. — Annual, hirsute, stems erect, 20-60 cm high, branched.



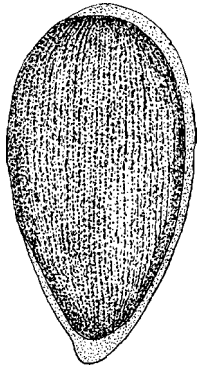
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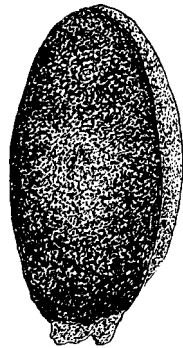
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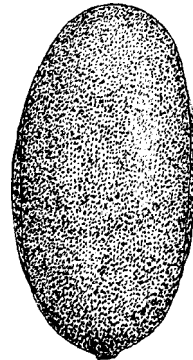
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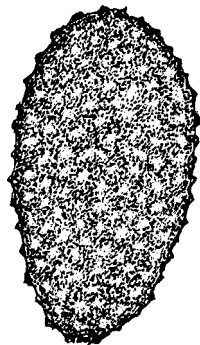
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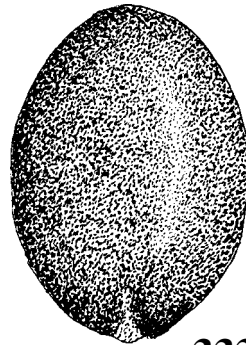
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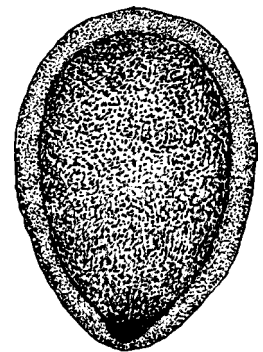
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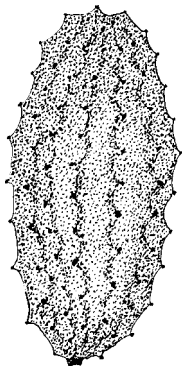
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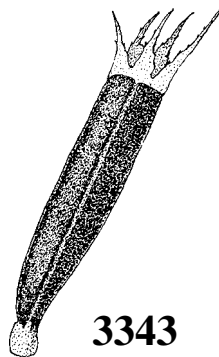
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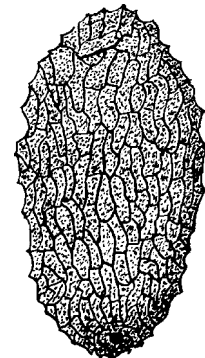
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Fruits achenes, prolonged ellipsoid, slight curved at base, apex truncate with five connate scales at base, bottom narrowed with hilum caruncle, 2-2.3 x 0.3-0.4 mm. Surface faint longitudinal furrowed with four longitudinal ridges, dull, black.  $2n = 20, 40$ . Native to tropical America; in the Carpathians rarely cultivated as a summer ornamental plant in gardens.

**3344. *Ageratum corymbosum*** Zucc. — Annual to perennial, pubescent to glabrous, stems 40-90 cm high. Fruits achenes, prolonged ellipsoid, slight curved at base, apex truncate with five connate, dense serrate scales at base, bottom with short hilum caruncle, 1.7-2 x 0.5-0.6 mm. Surface faint longitudinal furrowed with four longitudinal ridges, slight lustrous, black. Originally growing in North America; in the Carpathians seldom cultivated for ornament in parks.

**3345. *Ageratum houstonianum*** Mill., *A. mexicanum* Sims., *A. coelestinum* hort. — Perennial or small shrub, hirsute, stems erect, 10-60 cm high, branched. Fruits achenes, prolonged obovoid or ellipsoid, slight bended at base, apex truncate with 5-6 free, ciliated with serrate scales, base narrowed with hilum caruncle, 2.7-3 x 0.4-0.6 mm. Surface fine furrowed with four longitudinal ridges, black, scales and hilum whitish.  $2n = 20$ . Originally growing in tropical America (Mexico); usually cultivated for ornament in gardens, uniquely naturalized. Hu, Ro, Sk, Uk.

**3346. *Eupatorium cannabinum*** L. — Perennial, up to 30-160 cm high, unbranched, densely leafy. Fruits achenes, prolonged ellipsoid, apex truncate with light-brownish pappus, narrow base with the rest of hilum, 3-3.4 x 0.5-0.6 mm. Surface fine, longitudinal furrow, lustrous, glabrous, dark-brown.  $2n = 20$ . Native to Europe, wet lowland woods, felled areas, brook-banks, wet stony grounds; often cultivated as ornamental plant in gardens. Hu, Mo, Pl, Ro, Sk, Uk.

**3347. *Eupatorium purpureum*** L. — Perennial, stems 150-250 cm high, strong, unbranched, leaves lanceolate, dentate. Fruits achenes, oblong ellipsoidal, 4-ribbed, apex with yellowish-white to violet pappus, 3.4-4.2 x 0.5-0.6 mm. Surface scarce and short hairy or bare, dull, pale-brown. Native to North America on moist stands; in the Carpathians cultivated rarely, mostly in natural parks.

**3348. *Solidago altissima*** L. — Perennial, 70-200 cm high, stems and leaves densely hirsute, anthodia

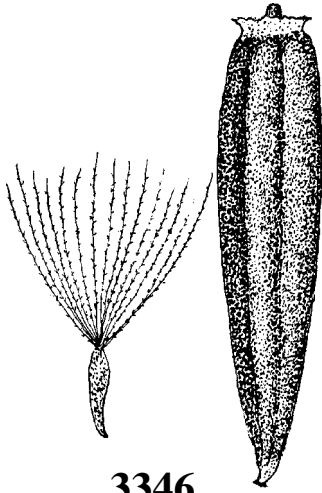
bigger, involucre 3.5-5 mm long. Fruits achenes, oblong-cylindric, apex truncate with pappus, bottom gradually narrowed, 1.2-1.4 x 0.3-0.5 mm (without pappus). Surface dense hirsute, lustreless, pale-brown.  $2n = 54$ . Originally growing in North America; in the Carpathians occasionally cultivated as ornamental, permanent plant in parks and gardens.

**3349. *Solidago canadensis*** L., *Aster canadensis* (L.) Kuntze — Perennial, up to 30-150 cm high, stems unbranched, glabrous below, pubescent above, densely leafy. Fruits achenes, prolonged ellipsoid, apex truncate with whitish pappus, base narrowed with whitish rest of hilum, 1-1.2 x c. 0.3 mm. Surface with 4-8 ridges, fine hairy, pale-brown.  $2n = 18$ . Originally growing in North America; introduced and cultivated in parks and gardens; in the Carpathians commonly naturalized in waste places, coastal shrubberies and wet barren grounds. Hu, Mo, Pl, Ro, Sk, Uk.

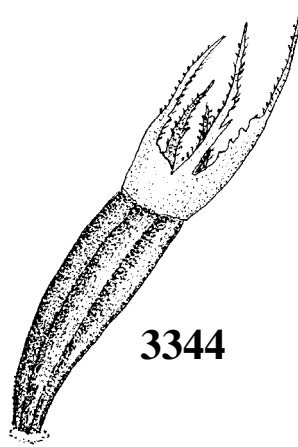
**3350. *Solidago gigantea*** Ait., *S. serotina* Ait. var. *gigantea* (Aiton) A. Gray — Perennial, up to 50-250 cm high, glabrous, greyish-green, purplish below. Fruits achenes, prolonged ellipsoid, apex truncate with yellowish pappus, base narrowed with rest of hilum, 1.2-1.4 x 0.3-0.4 mm. Surface with 4-8 ridges, faint hairy, dull, pale-brown.  $2n = 18, 36, 54$ . Originally spread from North America, often as a weed, or ornamental and honey-bearing plant in parks, gardens and coastal shrubberies. Hu, Pl, Ro, Sk.

**3351. *Solidago graminifolia*** (L.) Salisb., *S. lanceolata* L., *Chrysocoma graminifolia* L. — Perennial, up to 30-150 cm high, stems unbranched, coarse-hairy below. Fruits achenes, prolonged ellipsoid, apex truncate with dirty-white pappus, base narrowed with hilum, 0.7-0.9 x c. 0.3 mm. Surface without ridges, hairy, pale-brown.  $2n = 18$ . Native to North America, often cultivated as a permanent ornamental plant in parks, rarely naturalized. Pl, Ro, Sk, Uk.

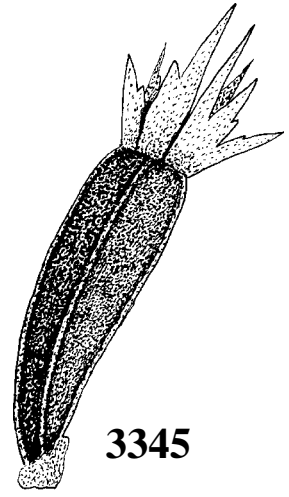
**3352. *Solidago virgaurea*** L. — Perennial, up to 100 cm high, unbranched, glabrous below, pubescent above. Fruits achenes, prolonged obcylindric or ellipsoid, apex truncate with dirty-yellowish c. 5 mm long pappus, base gradually narrowed with rest of hilum below, 3.6-4.2 x 0.6-0.8 mm. Surface with 8-12 haired ridges, lustreless, dark-brown.  $2n = 18$ . Native to Europe and North America, light woods, scrubby sunny slopes and rocks, alpine meadows and pastures; in all Carpathian territories.



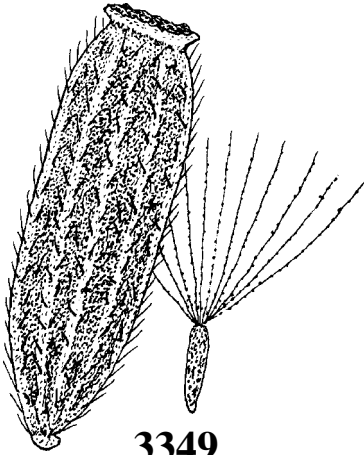
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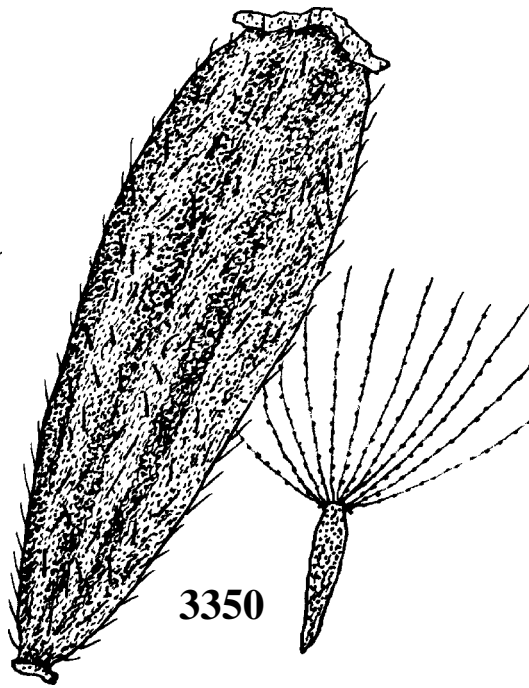
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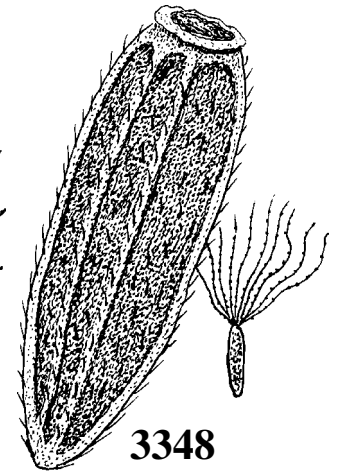
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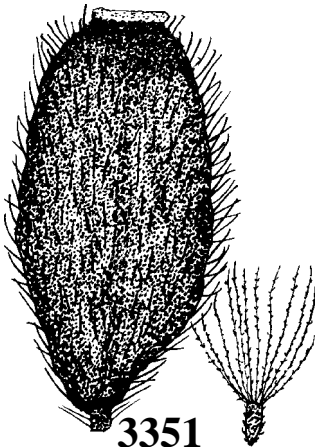
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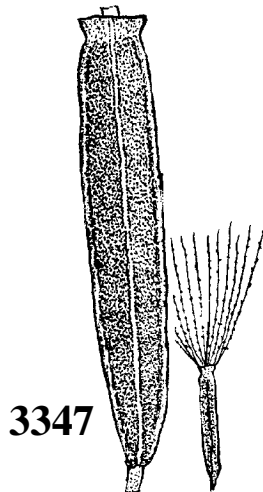
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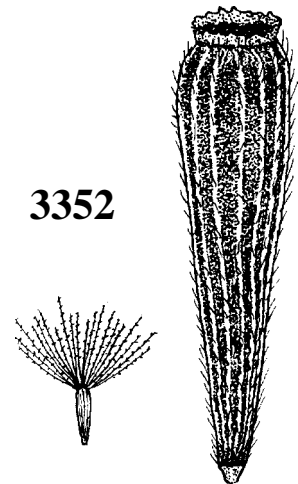
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**3353. *Grindelia squarrosa*** (Pursh) Dunal – Biennial to perennial, up to 30-60 cm high, stems erect, ramified above, scaled, viscid. **Fruits achenes, prolonged ellipsoid, slight curved below, apex truncate with easily deciduous pappus, base mostly rounded, 3.2-3.7 x 1.3-1.7 mm. Surface usually longitudinal furrowed or smooth, lustrous, light-brown. 2n = 12, 24.** Native to North America, in the past cultivated also in the Carpathians as medicinal plant, rarely naturalized. Uk.

**3354. *Brachycome iberidifolia*** Benth. – Annual, up to 30 cm high, stems erect, broomy branched. **Fruits achenes, claviform, apex truncate without pappus, more or less gradually narrowed from apex up to base with rest of hilum, 1.6-2 x 0.6-0.7 mm. Surface smooth or longitudinal furrowed, dull, silverish-white. 2n = 18.** Native to Australia; in the Carpathians sometimes grown as an ornamental summer herb in gardens.

**3355. *Bellis perennis*** L. – Perennial, flower peduncles, 5-15 cm high, glabrous or shortly pubescent, leaves in ground rosette. **Fruits achenes, ovoid, much compressed, with broad margin around, apex without pappus, 1.4-1.6 x 0.8-0.9 mm. Surface disperse hairy, slight lustrous, pale-brown, hem light-brown. 2n = 18.** Native to Europe, grassy places, boundaries, meadows, pastures; throughout the Carpathians.

**3356. *Bellidiastrum michelii*** Cass., *Aster bellidiastrum* (L.) Scop. – Perennial, leaves in basal rosette, stems erect, 10-30 cm high, pubescent, without leaves. **Fruits achenes, prolonged ellipsoid with narrow margin around, apex truncate with light-brown pappus, gradually narrowed from apex to base, 2-2.4 x 0.6-0.8 mm. Surface scarce hairy. 2n = 18.** Native to the higher mountains of Europe, on calcite rocks, grassless slopes, wood margins of the alpine zone. Hu, Pl, Ro, Sk.

**3357. *Tripolium pannonicum*** (Jacq.) Dobrocz., *T. vulgare* Nees, *Aster pannonicus* Jacq., *A. tripolium* L. – Annual to perennial, up to 50 cm high, stems erect or ascending, floccose, branched, glabrous. **Fruits achenes, prolonged obovoid or slight club-shaped, apex truncate with collarlet and whitish-brown pappus, 3.8-4.2 x 1.1-1.3 mm. Surface faint longitudinal furrowed, hairy, brown. 2n = 18.** Native to Eurasia, saline meadows and pastures. Hu, Mo, Sk, Uk.

**3358. *Aster acris*** L., *A. sedifolius* L. – Perennial, stems 30-100 cm high, branched, with erect, stiff, but thin twigs. **Fruits achenes, cylindric, lateral compressed with 4 ribs, yellowish pappus 1.5 to 2x as long as the achene, 4.5-5.1 x 1.5-1.7 mm. Surface appressed hairy, dull, dark-brown.** Native to southern Europe, semisteppe stands, scarce in shrubberies; in the Carpathians planted in natural parks, gardens and at walls.

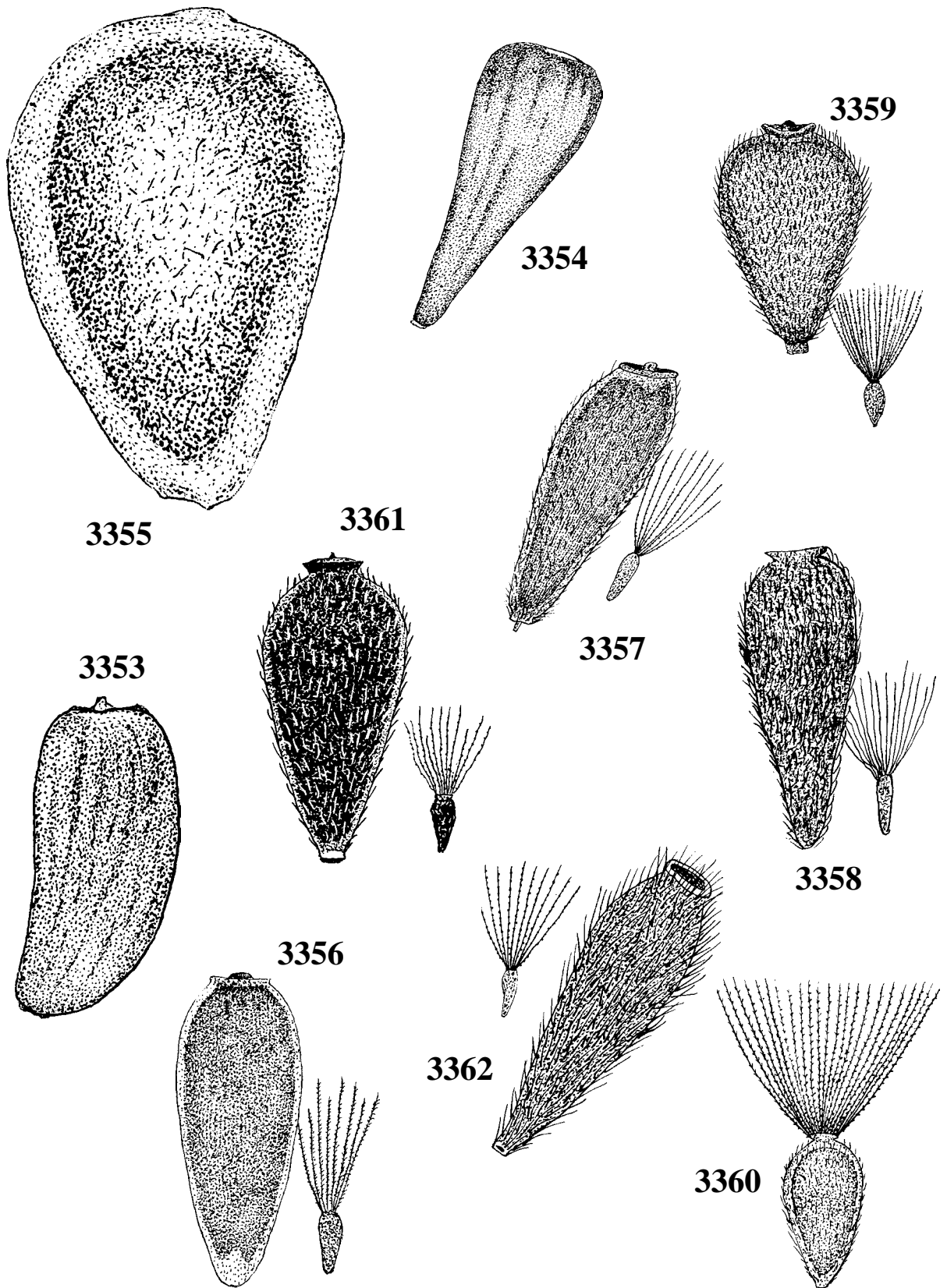
**3359. *Aster alpinus*** L., *A. breyninus* (Beck) Fritsch – Perennial, up to 5-30 cm high, stems ascending to erect, glabrous or pubescent, scarce leafy. **Fruits achenes, obovate, compressed, apex truncate with collarlet and light-brown pappus, with hem around, gradually narrowed from apex to base, 3-3.5 x 1.5-1.8 mm. Surface scattered hairy, dull, dark-brown. 2n = 18.** Native to southern and central Europe and western Asia, overgrown calcite rocks and sunny stony slopes. Hu, Pl, Ro, Sk, Uk.

**3360. *Aster ameloides*** Besser, *A. amellus* auct. non L., *A. scepuciensis* Kit. et Kanitz – Perennial, up to 20-70 cm high, stems erect, leafy, ramified above, often purplish. **Fruits achenes, obovoid, lateral compressed with hem around, apex with whitish-yellow pappus, gradually narrowed from apex up to base, 3.8-4.2 x 1.8-2 mm. Surface whitish hairy, dull, brown. 2n = 18.** Native to central Europe and western Asia, sunny shrubby and stony slopes, steppe meadows, basic to neutral soils, in big-flowered cvs cultivated in gardens and rock-gardens. Br, Hu, Pl, Ro, Sk, Uk.

**3361. *Aster amellus*** L. – Perennial, stems erect, leafy, branched above, shortly hirsute or hairless, often reddish, leaves whole-leaved or delayly crenate. **Fruits achenes, obovoid, lateral compressed, with collarlet and whitish-yellow pappus above, 3.4-3.8 x 1.5-1.8 mm. Surface dull, dark-brown, margin hem pale-brown, hairs white. 2n = 18.** Native to southern and central Europe, sunny, shrubby and stony slopes, steppe meadows on warmed places.

**3362. *Aster canus*** Waldst. et Kit., *Galatella cana* Nees – Perennial, up to 30-100 cm high, stems erect, pubescent or tomentose above, glabrescent below, ramified above. **Fruits achenes, club-shaped, lateral compressed, apex with light-brown pappus, 3.5-4 x 1-1.2 mm. Surface patent-hairy, dull, brown.** Native to southeastern Europe, wet saline stands and shrubby slopes. Hu, Ro.





**3363. *Aster cordifolius* L., *A. heterophyllus* Willd.** — Perennial, up to 60-150 cm high, glabrous or pubescent, stem erect, leafy, branched above. **Fruits achenes, prolonged ellipsoid, lateral compressed, with 4 rarely 5 ridges, biconvex, apex with whitish pappus, 1.8-2.6 x 0.6-0.7 mm. Surface faint longitudinal furrowed, lustrous, brown. 2n = 18, 36.** Originally introduced from North America; in the Carpathians rarely cultivated for ornament in gardens, uniquely naturalized.

**3364. *Aster divaricatus* L., *A. corymbosum* Ait.** — Perennial, up to 20-60 cm high, stem erect, undulated, ramified, non-glandular, blackish-purple. **Fruits achenes, prolonged ellipsoid or fusiform with small collarlet and yellowish pappus at apex, 2.6-3 x 0.7-0.8 mm. Surface with 8-10 longitudinal ridges, dull, dark-brown. 2n = 18, 20.** Originally growing in North America; in the Carpathians sometimes cultivated for ornament in gardens, rarely naturalized.

**3365. *Aster dumosus* L.** — Perennial, up to 30-90 cm high, stems paniculately branched. **Fruits achenes, club-shaped, lateral compressed, apex truncate with collarlet and whitish-yellow pappus, 2.4-2.6 x 0.7-0.9 mm. Surface scarce patent-hairy, dull, brown.** Native to North America; in the Carpathians cultivated for ornament in gardens.

**3366. *Aster ericoides* L.** — Perennial, up to 30-90 cm high, stems glabrous, many-branched above. **Fruits achenes, spindleform, slight compressed with 4-5 longitudinal ridges, apex and base narrowed, apex with whitish pappus, 2.8-3.3 x 0.7-0.9 mm. Surface smooth, glabrous, lustreless, pale-brown.** Native to North America, commonly cultivated for ornament in gardens, flowering in autumn.

**3367. *Aster laevis* L., *Symphotrichum laeve* (L.) Á. et D. Löve** — Perennial, up to 30-120 cm high, stems erect, glabrous, greyish-green, often erect, glabrous, greyish-green, often purplish. **Fruits achenes, prolonged fusiform or ellipsoid, compressed, with 4 or 5 longitudinal ridges, apex truncate with whitish pappus, base narrowed, 2.5-3 x 0.6-0.8 mm. Surface smooth, glabrous, dull. 2n = 48, 54.** Native to North America, cultivated as a perennial plant in gardens, naturalized near water.

**3368. *Aster lanceolatus* Willd., *A. frutescens* Wimm.** — Perennial, up to 50-120 cm high, stems glabrous, erect. **Fruits achenes, club-shaped,**

**biconvex, with 4 longitudinal ridges, apex truncate with collarlet and whitish pappus, 1.9-2.3 x 0.6-0.7 mm. Surface glabrous, slight brown, ridges pale-brown. 2n = 64.** Native to North America, riverbanks and waste places; introduced and planted in the Carpathians for ornament, locally naturalized.

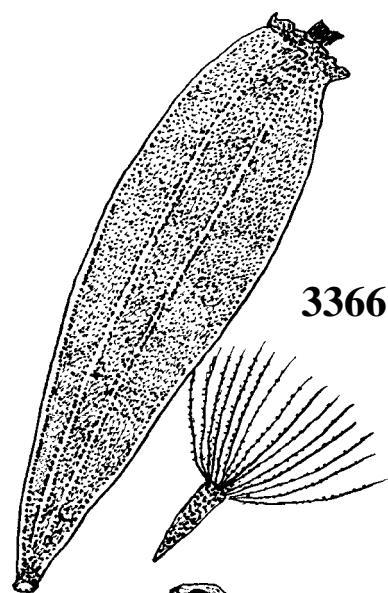
**3369. *Aster macrophyllus* L.** — Perennial, 30-80 cm, with non-flowering rosettes, stems glandular-puberulent above, green or purple-tinged. **Fruits achenes, ± spindleform, apex truncate with yellowish pappus, bottom narrowed, 3.5-4 x 0.8-0.9 mm. Surface longitudinal ribbed, smooth, dark-brown.** Native to North America; in the Carpathians rarely grown for ornament in gardens, locally naturalized.

**3370. *Aster novae-angliae* L., *Lasalea novae-angliae* (L.) Semple et al. et Brouillet** — Perennial, up to 30-200 cm high, stems erect, stout, hirsute-glandular above, the whole stem branched. **Fruits achenes, spindleform, apex and base narrowed, apex with pale-pinkish collarlet, 2.7-3.3 x 0.7-0.9 mm. Surface hairy, dull, brown. 2n = 10.** Native to North America; sometimes cultivated as ornamental in gardens, rarely naturalized. Hu, Mo, Pl, Ro, Sk, Uk.

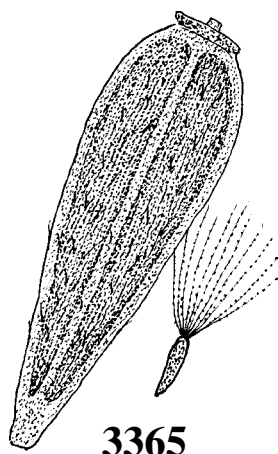
**3371. *Aster novi-belgii* L.** — Perennial, up to 60-150 cm high, stems erect, glabrous below, slightly pubescent and branched above. **Fruits achenes, club-shaped or spindleform, compressed, apex with whitish pappus, gradually narrowed from apex into base, 2.7-3.3 x 0.6-0.8 mm. Surface smooth, slight lustrous, brown. 2n = 18, 48, 50, 54.** Originally introduced from North America, grown as an ornamental, commonly cultivated and naturalized near brooks and rivers. Hu, Mo, Pl, Ro, Sk, Uk.

**3372. *Aster parviflorus* Nees, *A. tradescantii* L.** — Perennial, up to 60-120 cm high, soft-pubescent, stems erect. **Fruits achenes, prolonged obovoid, compressed, apex with whitish pappus, base narrowed, 2-2.5 x 0.5-0.6 mm. Surface scarce adjacent hairy, with four longitudinal ridges, slight lustreless, brown.** Originally introduced from North America, on river alluvia; in the Carpathians often grown in gardens and naturalized in coastal shrub-beries. Ro, Sk.

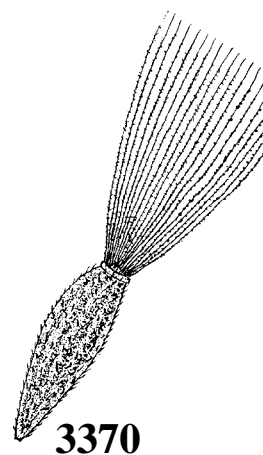
**3373. *Aster sedifolius* L. subsp. *sedifolius*** — Perennial, stems ascending up to erect, corymbose above, leaves on the border and often also on facial side coarse, inflorescence of 5-12 flowers. **Fruits**



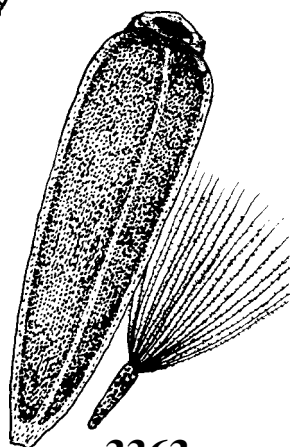
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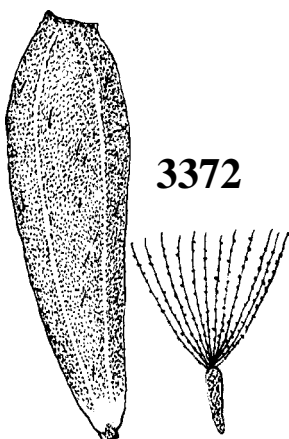
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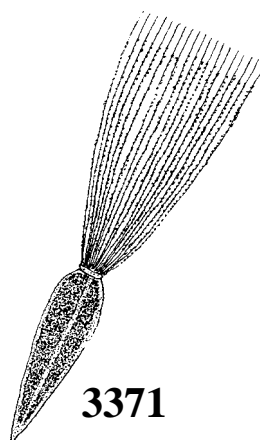
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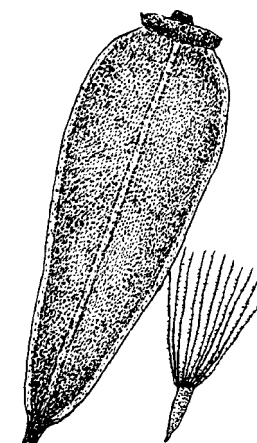
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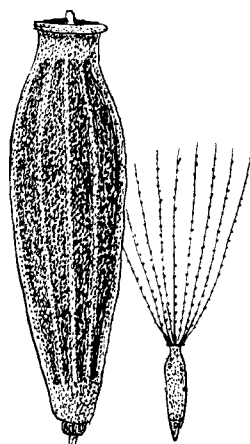
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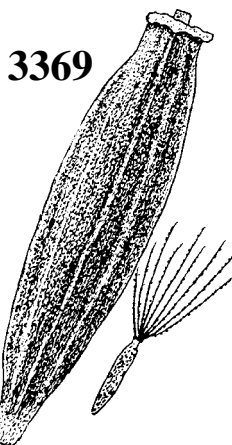
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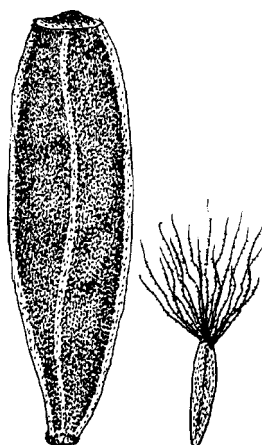
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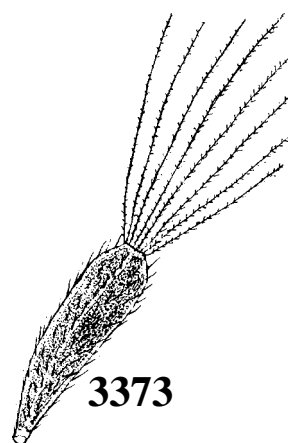
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achenes, oblong cuneiform, with 4 or 5 ribs, lateral compressed, apex with pappus 1.5x as long as the achene, 2.1-2.6 x 0.5-0.6 mm. Surface faint lustrous, brown.  $2n = 36$ . Native to Eurasia, on saline meadows with alkaline warm, clay soils, rarely cultivated in gardens. Ro.

**3374. *Aster x salignus*** Willd., *A. hungaricus* Poir., *A. salicifolius* Scholler non Lam. — Perennial, up to 20-120 cm high, stems glabrous, pubescent above, branched. **Fruits achenes, club-shaped, biconvex, with 4-5 longitudinal ridges, lateral flattish, apex truncate with whitish pappus, 2.8-3.3 x 0.5-0.7 mm. Surface scarce appressed hairy, smooth, brown.** Native to North America of hybrid origin (*A. lanceolatus* x *novi-belgii*), cultivated for ornament in gardens, sporadically naturalized. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**3375. *Aster x versicolor*** Willd., *A. laevigatus* Willd. l. c. — Perennial, up to 60-120 cm high, stems erect, glabrous. **Fruits achenes, club-shaped or obconical, lateral compressed, apex with whitish-yellow pappus, 1.5x as long as the achene, 2.5-2.9 x 0.9-1.1 mm. Surface scarce hairy, brown.** Native to North America; introduced and cultivated for ornament in gardens, mentioned as hybrid (*A. laevis* x *novi-belgii*). Hu, Ro.

**3376. *Crinitina linosyris*** (L.) Soják, *Aster linosyris* (L.) Bernh., *Linosyris vulgaris* DC. — Perennial, up to 10-50 cm high, stout, glabrous, stems erect or shortly ascending. **Fruits achenes, ellipsoid, lateral compressed, apex with whitish-yellow pappus, 2.3-3 x 0.9-1.1 mm. Surface patent-hairy, dull, brown.  $2n = 18$  (36).** Native to Eurasia, sunny grassy and shrubby slopes, overgrown rocks and dry pastures. Hu, Mo, Pl, Ro, Sk, Uk.

**3377. *Crinitina oleifolia*** (Lam.) Dostál, *Aster villosus* (L.) Schultz-Bip., *Linosyris villosa* (L.) DC. — Perennial, up to 15-35 cm high, stems erect, branched above, tomentose. **Fruits achenes, cylindrical, biconvex, with 4 longitudinal furrows, gradually narrowed from apex to base, apex with pale-rusty pappus, 2.8-3.2 x 0.9-1.1 mm. Surface dense hairy, hairs silverish-white.** Native to southeastern Europe, Balkan Peninsula, hay-meadows, sunny to dry littoral areas. Hu, Mo, Ro, Uk.

**3378. *Callistephus chinensis*** (L.) Nees, *Aster chinensis* L. — Annual, up to 10-80 cm high, stems erect, patent-short hirsute, simple, rarely

branched, leafy. **Fruits achenes, club-shaped, biconvex, ventral side with indistinct ridges, lateral compressed, apex truncate with 2-rowed deciduous pappus, 3.8-4.3 x 1.7-2 mm. Surface short appressed hirsute, dull, brown.** Originally growing in eastern Asia; in the Carpathians commonly cultivated in gardens, uniquely naturalized.

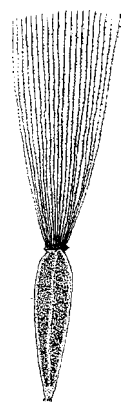
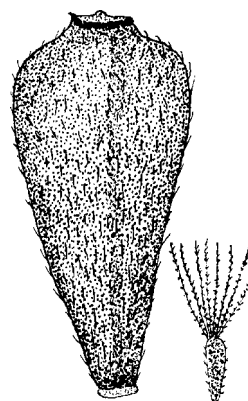
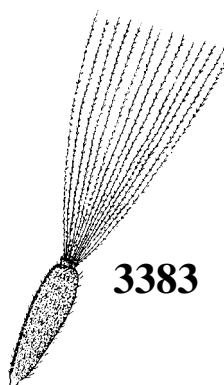
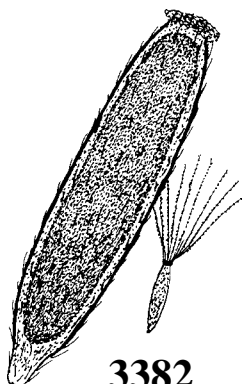
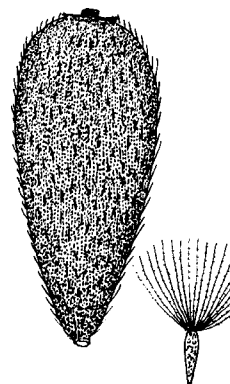
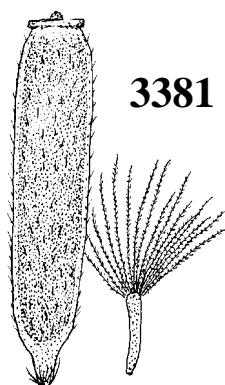
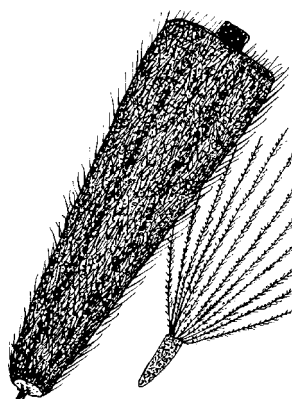
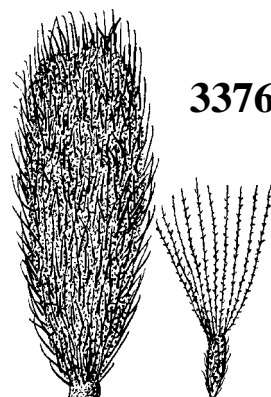
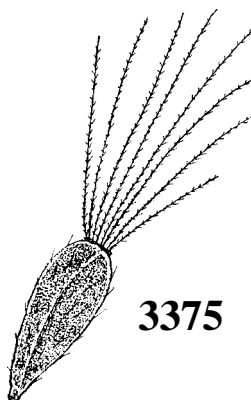
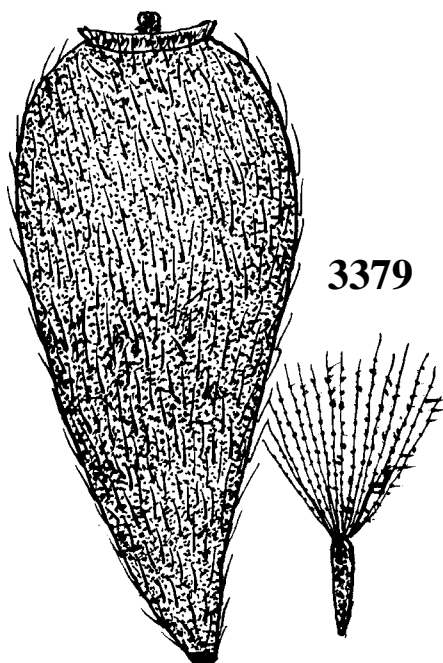
**3379. *Galatella cana*** (Waldst. et Kit.) Nees — Perennial, up to 60-120 cm high, stems  $\pm$  glabrous or slightly pubescent, ramified above. **Fruits achenes, clubform, laterally compressed, apex with yellowish pappus, 3.4-3.8 x 1.5-1.8 mm. Surface dense hairy, dull, brown.  $2n = 36$ .** Native to Eurasia, on saline meadows and in shrubberies. Hu, Ro, Sk.

**3380. *Galatella punctata*** Cass., *Aster punctatus* Waldst. et Kit. — Perennial, up to 60-120 high, stems  $\pm$  glabrous or slightly pubescent, ramified above. **Fruits achenes, club-shaped, lateral flattish, apex with yellowish pappus, 3.8-4.3 x 1.5-1.7 mm. Surface dense hairy, dull, brown.  $2n = 36$ .** Native to Euro-Siberia, wet saline podzol grounds, calcifuge. Hu, Mo, Ro, Sk, Uk.

**3381. *Erigeron acris*** L., *Trimorpha acris* (L.) Grey — Annual to biennial, coarsely hairy, glandular above, stems erect, 10-60 cm high, branched above. **Fruits achenes, cylindric, lateral compressed, around with reddish hem, apex truncate with whitish pappus, 1.8-2.2 x 0.4-0.5 mm. Surface smooth, sparse hairy, glaucous.  $2n = 18$ .** Native to Europe, dryer grassy and shrubby slopes, overgrown rocks, pastures and boundaries; nearly in all Carpathian territories.

**3382. *Erigeron alpinus*** L., *E. intermedius* Schleich., *Trimorpha alpina* (L.) Vierh. — Perennial, up to 25 cm high, stems ascending to erect. **Fruits achenes, cylindrical, lateral compressed, around with reddish hem, 2.6-2.8 x 0.5-0.6 mm. Surface smooth, scarce hairy, pale-brown.  $2n = 18$ .** Native to mountains of the Alps and Carpathians, grassy and stony slopes. Pl, Ro, Sk, Uk.

**3383. *Erigeron atticus*** Vill., *E. carpaticus* Griseb. et Schenk, *E. villarsii* Bellardi — Perennial, whole plant densely hairy, short hairs glandular, stems erect, 15-40 cm high, ramified above. **Fruits achenes, cylindrical, compressed, with reddish hem around, apex with whitish pappus, 2.4-2.8 x 0.5-0.6 mm. Surface smooth, scarce hairy, pale-brown.  $2n = 18$ .** Native



to high mountains of the Alps and Carpathians, stony meadows, overgrown rocks and screes. Pl, Ro, Sk.

**3384. *Erigeron aurantiacus*** Rgl. — Perennial, stems 20-40 cm high, sparsely branched above, leaves oblong-lanceolate. **Fruits achenes, ellipsoid, lateral compressed, apex truncate with sparse whitish pappus, 1.7-2.1 x 0.6-0.7 mm. Surface smooth, hairy, lustrous, pale-brown.** Native to Turkestan, growing in the montane zone; in the Carpathians rarely cultivated in rock-gardens, mostly as hybrids (*E. aurantiacus* x *carpathicus*).

**3385. *Erigeron glabratus*** Hoppe et Hornsch. ex Bluff et Finger, *E. polymorphus* Scop. — Perennial, up to 5-25 cm high, stem ascending to erect. **Fruits achenes, cylindric or prolonged club-shaped, lateral compressed, with purplish hem around, apex with light-brown pappus, 2.4-2.6 x c. 0.5 mm. Surface smooth, slight lustrous, brown. 2n = 18.** Native to the Alps and Carpathians, calcareous, wet, stony and grassy mountain meadows, overgrown rocks and screes. Pl, Ro, Sk.

**3386. *Erigeron hungaricus*** (Vierh.) Pawl., *E. neglectus* auct. non A. Kern., *Trimorpha hungarica* Vierh. — Biennial to perennial, up to 6-25 cm high, stems erect or crooked a little, glabrous below or slightly pubescent. **Fruits achenes, club-shaped, compressed, apex truncate with pale-rusty pappus, 2.3-2.7 x 0.6-0.8 mm. Surface smooth, hairy, pale-brown.** Native to Europe, rocky and stony slopes, screes of the alpine zone. Pl, Sk.

**3387. *Erigeron nanus*** Schur, *E. neglectus* Kern. var. *nanus* (Schur) Jáv. — Perennial, stems up to 15 cm high, basal leaves 0.6-1.4 cm wide, spatulate. **Fruits achenes, oblong ± cylindric, lateral compressed, hairy pappus 1.5-2x as long as the achene, 2.3-2.7 x 0.6-0.7 mm. Surface adpressed scarce hairy, pale-brown. 2n = 18.** Native to the Carpathians, in rocks and mountains grasslands, at altitudes of 1400-2000 m, calcicole. Pl, Ro, Sk.

**3388. *Erigeron politus*** Fries, *E. elongatus* Ledeb. — Biennial, perennial, stems 40-60 cm high, erect, leaves glabrous, usually shiny. **Fruits achenes, obconical, tetragonal with 4 ribs, apex with yellowish-white pappus a little longer than the achene, bottom acuminate, 3.5-4 x 0.5-0.6 mm. Surface smooth, slight lustrous, dark-grey. 2n = 18.** Native to south-eastern Europe, meadows, woodlands and shrub-beries. Uk.

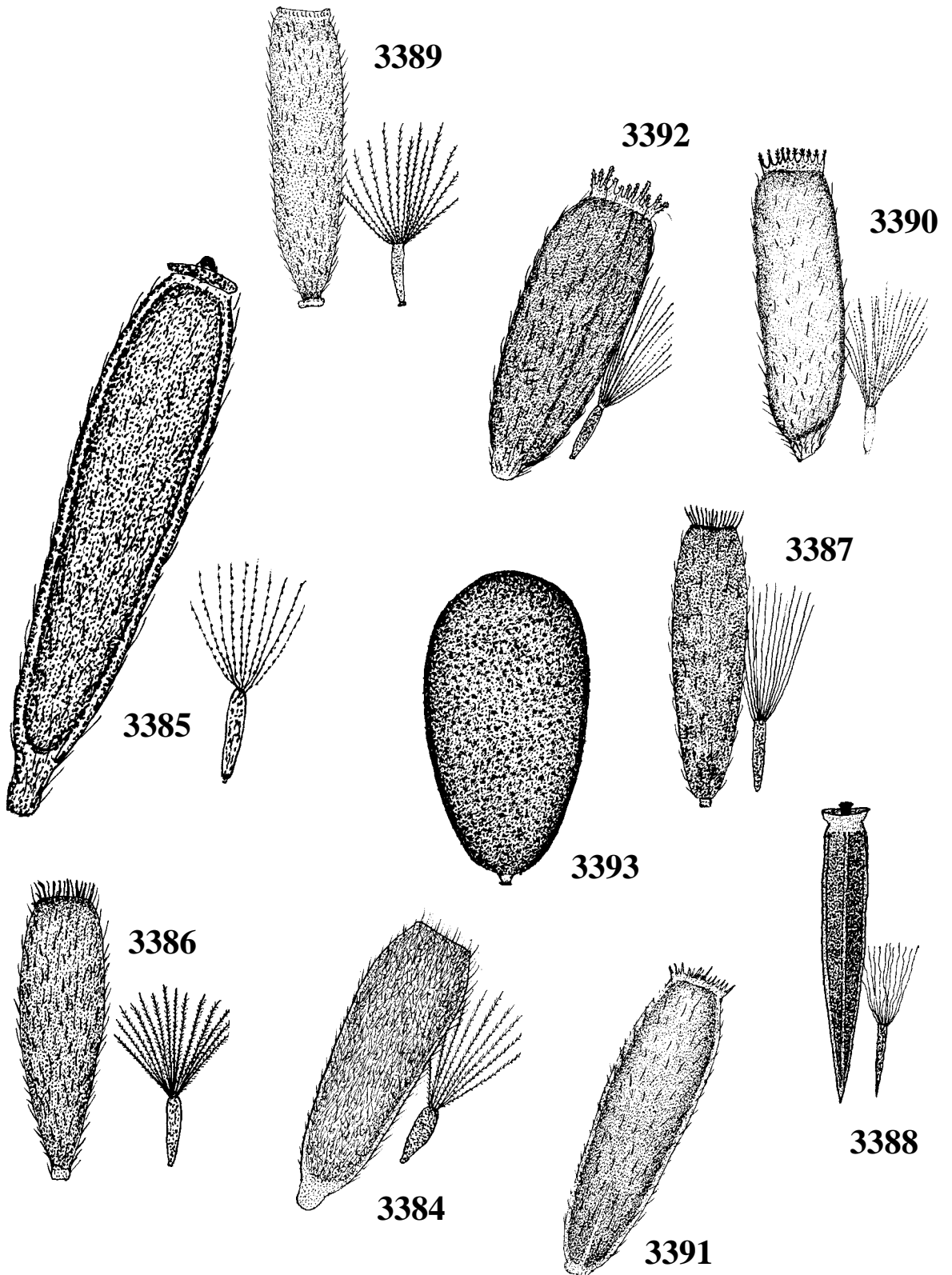
**3389. *Erigeron uniflorus*** L., *E. uniflorus* var. *tatrae* Vierh. — Perennial, only 15 cm high, stems arcuate, erect, slightly pubescent above, flowers violet, pink or white. **Fruits achenes, cylindric, apex truncate with pale rusty-brown pappus, bottom narrowed, 2-2.8 x 0.4-0.6 mm. Surface hairy, glabrous, pale-greyish. 2n = 18.** Native to Eurasia, snowpatches, stony slopes, alpine pastures and meadows, moist stands of the alpine zone. Pl, Ro, Sk, Uk.

**3390. *Conyza canadensis*** (L.) Cronquist, *Erigeron canadensis* L. — Annual to biennial, up to 15-120 cm high, stems erect, cylindric, ± striate, simple, much ramified. **Fruits achenes, prolonged ellipsoid, lateral compressed, apex truncate with whitish pappus, 1.1-1.3 x 0.3-0.4 mm. Surface smooth, scarce hairy, slight lustrous, greyish-brown. 2n = 18.** Originally growing in North America; in the Carpathians naturalized in fields, fallows, waste places, cut-over areas and sandbanks. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**3391. *Stenactis annua*** (L.) Nees, *Erigeron annuus* (L.) Pers., *Aster annuus* L. — Annual to perennial, glabrous or pubescent, 50-100 cm high, stems erect, densely leafy. **Fruits achenes, prolonged ellipsoid, lateral flattish, with hem around, apex truncate with wreath of short teeth, 1-1.2 x c. 0.3 mm. Surface smooth, appressed hairy, yellowish-brown. 2n = 26, 27, 36.** Originally introduced from North America; in the Carpathians naturalized in waste places, gardens, roadsides, coastal shrubs and lowland forests. Hu, Mo, Pl, Ro, Sk, Uk.

**3392. *Stenactis speciosa*** Lindl., *Erigeron speciosus* (Lindl.) DC. — Perennial, up to 40-80 cm high, stems erect, slender, scarce hirsute. **Fruits achenes, prolonged ellipsoid, compressed, around with purplish hem, edges and the ventral side with longitudinal red ribs, apex truncate with whitish pappus, 1.8-2.2 x 0.6-0.7 mm. Surface smooth, appressed hirsute, slight lustrous, pale-brown. 2n = 18, 36.** Native to North America; in the Carpathians rarely cultivated as ornamental, uniquely naturalized.

**3393. *Filago lutescens*** Jord., *F. apiculata* G. E. Sm. ex Bab. — Annual, up to 10-25 cm high, stems erect, yellowish pubescent, irregularly branched. **Fruits achenes, obovoid, transversal section ellipsoid, apex rounded, base slight narrowed, 0.7-0.8 x c. 0.4 mm. Surface longitudinal shallow furrowed,**



short hairy, slight lustrous, glossy dotted, pale-brown, margin dark-brown.  $2n = 28$ . Native to Europe, grassy pastures, dry hills, sandbanks, fallows and roadsides. Ro, Sk.

**3394. *Filago pyramidata* L., *F. spathulata* J. et C. Presl.** — Perennial, up to 5-30 cm high, stems erect, ramified above. **Fruits achenes, prolonged cylindric or obovoid, slight compressed, apex with easy-deciduous pappus, 0.7-0.9 x 0.3-0.4 mm. Surface tuberculate with distinct papillae, lustrous, greyish-brown.  $2n = 28$ .** Native to Europe, dry, grassy places, pastures and arable lands. Ro.

**3395. *Filago vulgaris* Lam., *F. germanica* L. non Huds.** — Annual, up to 5-35 cm high, greyish-white, downy, over half ramified. **Fruits achenes, ellipsoid, transversal section round, apex as well, base narrowed with hilum, 0.7-0.9 x 0.3-0.4 mm. Surface with whitish papillae, lustrous, greenish-brown.  $2n = 28$ .** Native to Eurasia, grassy pastures, dry hills, sandbanks, roadsides, fallows, mostly on calcareous grounds. Hu, Mo, Pl, Ro, Sk, Uk.

**3396. *Logfia arvensis* (L.) Holub, *Filago arvensis* L., *Oglifa arvensis* (L.) Cass.** — Annual, up to 5-40 cm high, free up to patent greyish-white pubescent, stem erect, ramified. **Fruits achenes, cylindric, apex truncate with easy-deciduous pappus, base narrowed, 0.4-0.5 x 0.15-0.2 mm. Surface smooth, scarce glossy, papillary, yellowish-brown.  $2n = 28$ .** Native to Eurasia, sunny, sandy and grassy hills and pastures, rocks, fallows, roads, throughout the Carpathians.

**3397. *Logfia minima* (Sm.) Dumort., *Filago minima* (Sm.) Pers.** — Annual, up to 5-20 cm high, greyish, pubescent, stems furcate, ramified above. **Fruits achenes, prolonged obovoid or cylindric, apex with easy-deciduous pappus, 0.6-0.7 x 0.2-0.3 mm. Surface with glossy papillae, glabrous, olivaceous-brown.  $2n = 28$ .** Native to Europe, sunny hills and pastures, sandbanks, rocks and road margins. Hu, Mo, Pl, Ro, Sk, Uk.

**3398. *Bombycilaena erecta* (L.) Smolj., *Micropus erectus* L.** — Annual, up to 5-20 cm high, greyish-white pubescent, stems erect, densely leafy, little branched. **Fruits achenes, club-shaped with small beak on one lateral side, apex broad, globose, base narrowed with hilum collar, all seeds closed in stiff felt cover, 1.8-2.1 x 1.2-1.4 mm.  $2n = 42$ .** Native to the Mediterranean, sunny and dry slopes and hills with stony-sandy soils. Hu, Ro, Sk, Uk.

**3399. *Liatris spicata* Willd.** — Perennial, up to 60-100 cm high, stems stout, erect, densely leafy, unbranched. **Fruits achenes, prolonged obovoid, apex truncate with pinkish-brown pappus, gradually narrowed toward base up to short hilum, 4.4-5 x 1.3-1.5 mm. Surface longitudinal ridged, scarce hairy, dull, brown.** Originally introduced from North America, growing on moist grounds; in the Carpathians rarely cultivated for ornament in gardens.

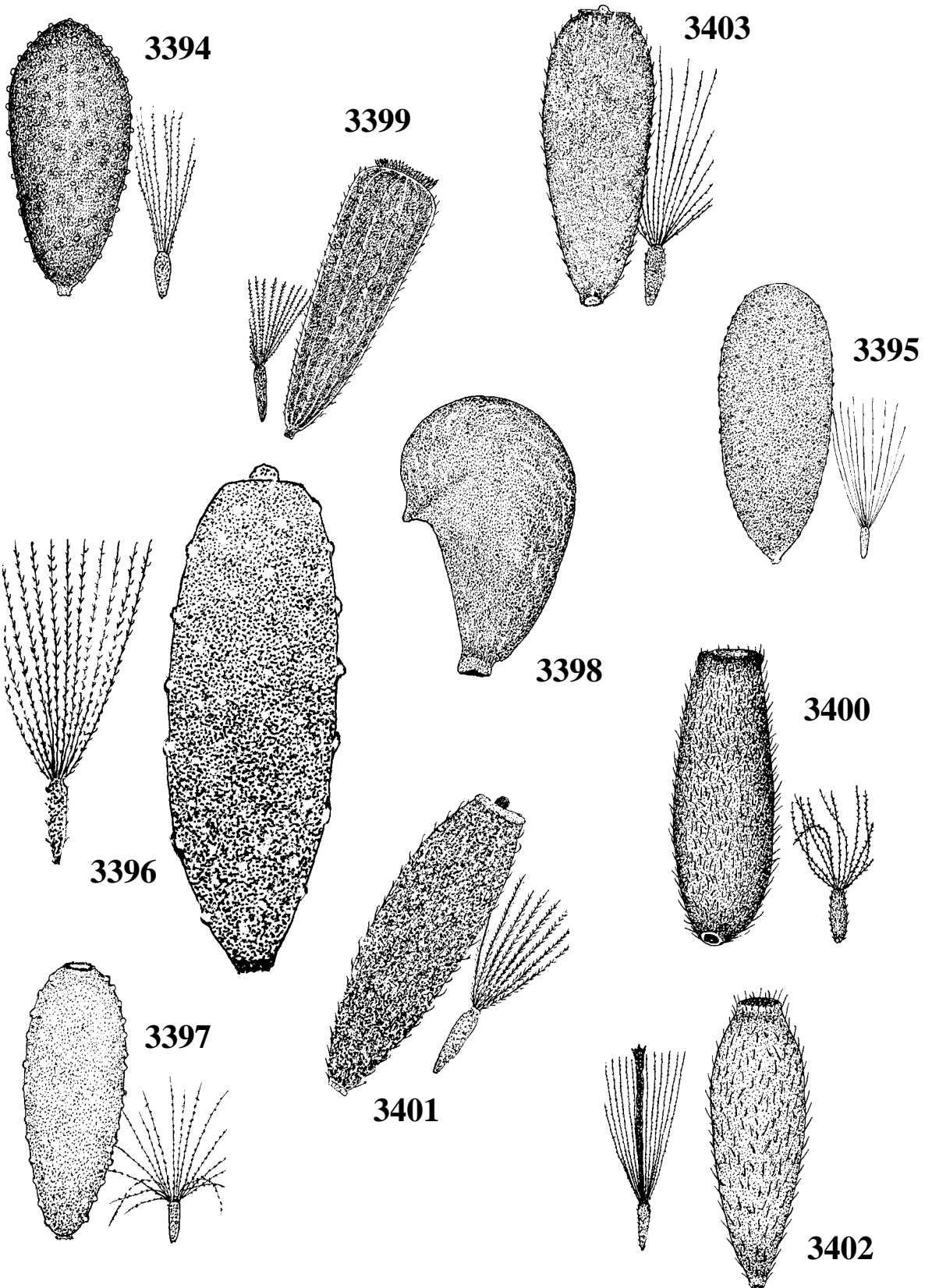
**3400. *Omalothea hoppeana* (W. D. J. Koch) Sch.-Bip., *Gnaphalium hoppeanum* W. D. J. Koch** — Perennial, up to 3-15 cm high, stems tufted, unbranched, poorly leafy. **Fruits achenes, prolonged cylindric, apex truncate with sparse pappus, base rounded with spherical hilum, 1.4-1.7 x 0.4-0.6 mm. Surface glabrous, short hairy, brown.  $2n = 28$ .** Native to Europe, stony and grassy mountain plains and overgrown rocky debris on calcareous grounds. Pl, Ro, Sk.

**3401. *Omalothea norvegica* (Gunnerus) Sch.-Bip., *Gnaphalium norvegicum* Gunnerus** — Perennial, up to 10-50 cm high, whitish pubescent, stems erect, simple, scarce leafy. **Fruits achenes, prolonged cylindric, apex truncate with white pappus, base narrowed, 1.3-1.6 x 0.4-0.5 mm. Surface hirsute, short hairs crooked, greyish-brown.  $2n = 56$ .** Native to arctic and high mountain Europe, clearings, dwarf pine areas, ridges and mountain plains. Pl, Ro, Sk.

**3402. *Omalothea supina* (L.) DC., *Gnaphalium supinum* L.** — Perennial, up to 12 cm high, white fleece, stems slender, erect, unbranched, many of them non-flowering. **Fruits achenes, prolonged obovoid or club-shaped, apex truncate with white pappus, base gradually narrowed, 1.4-1.6 x 0.4-0.5 mm. Surface glabrous, short hairy, slight lustrous, greyish-brown.  $2n = 28$ .** Native to arctic and mountain Europe, mountain planes and meadows rocks, snow deck-chairs, overgrown screes. Pl, Ro, Sk.

**3403. *Omalothea sylvatica* (L.) Sch.-Bip. et F. W. Schultz, *Gnaphalium sylvaticum* L.** — Perennial, up to 10-60 cm high, stems bended at base, further erect, simple or branched only in inflorescence. **Fruits achenes, ellipsoid, apex truncate with easy-deciduous pappus, base narrowed into hilum, 1.2-1.5 x 0.4-0.5 mm. Surface glabrous, covered with short hairs, lustrous, rusty-brown.  $2n = 56$ .** Native to Europe and western Asia, dry light forests





and shrubberies, cut-over areas, dry meadows and pastures. Hu, Pl, Ro, Sk.

**3404. *Filaginella uliginosa* (L.) Opiz, *Gnaphalium uliginosum* L.** — Annual, fleece pubescent up to glabrous, stems 5-20 cm high, ramified from base. **Fruits achenes, oblong-cylindric, slight compressed, apex with white, easy-deciduous, scarce pappus, bristles without eyelash, c. 0.6-0.2 mm. Surface glabrous, glossy, whitish papillose, or short-hairy, brown. 2n = 14.** Native to Eurasia, denuded sandy banks, boundaries, wet and overflowed roads, fields and fallows, calcifuge. Hu, Pl, Ro, Sk.

**3405. *Gnaphalium luteo-album* L., *Pseudognaphalium luteo-album* (L.) Hillard et B. L. Burt** — Annual, up to 15-55 cm high, stems erect, ramified from base or simple, greyish to white downy. **Fruits achenes, cylindric, apex truncate with yellowish or pale-rusty pappus, base slight narrowed with hilum, 0.5-0.6 x c. 0.2 mm. Surface scarce tuberculate, sometimes glabrous or short hairy, lustrous, reddish-brown. 2n = 14.** Native to Europe, now cosmopolitan, wet sandy fields, sandbanks of ponds, rivers and brooks. Br, Hu, Pl, Ro, Sk, UK.

**3406. *Helichrysum arenarium* (L.) Moench, *Gnaphalium arenarium* L.** — Perennial, up to 10-30 cm high, stems ascending or erect, unbranched, adpressed pubescent. **Fruits achenes, cylindric or prolonged obovoid, often gradually narrowed toward base, apex with yellow pappus, 0.9-1.1 x 0.4-0.5 mm. Surface grained, whitish papillose-tuberculate, pale-brown to brown. 2n = 28.** Native to Eurasia, mostly along rivers, on sandy deposits, rare in cooler areas; throughout the Carpathians.

**3407. *Helichrysum bracteatum* (Vent.) Andrews** — Semishrub, up to 40-120 cm high, stout, leafy only above. **Fruits achenes, cylindric with yellow pappus at apex, base truncate, 2-3 x 0.9-1.1 mm. Surface glabrous, longitudinal faint striate, dull, pale-brown. 2n = 28.** Originally growing in Australia; often cultivated in gardens for dry bouquets, temporarily escaping into ruderal places.

**3408. *Helichrysum corymbiforme* Opperm. ex Katina** — Perennial, stems numerous, 20-30 cm high, appressed tomentose, ascending, densely leafy up to flowers. **Fruits achenes, cylindric, lateral compressed, apex with whitish pappus, 0.8-1 x**

**0.2-0.3 mm. Surface scarce appressed hirsute, faint lustrous, dark-grey.** Native to southeastern European maritime sand lands. Uk.

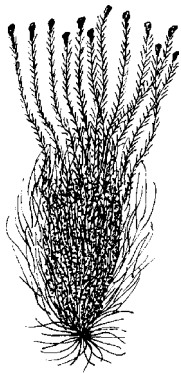
**3409. *Helichrysum italicum* (Roth) G. Don fil.** — Perennial, stems 20-50 cm high, angular, leaves 10-40 mm long, narrowly linear, sparsely tomentose to glabrescent. **Fruits achenes, cylindric, slight compressed, apex and bottom whitish, 0.8-1 x 0.4-0.5 mm. Surface fine granulate with scattered shining white glands or eglandular, dark-brown. 2n = 28.** Native to southern Europe, in dry places; rarely hauling into the southern Carpathian regions.

**3410. *Helichrysum orientale* (L.) Gaertn., *Gnaphalium orientale* L.** — Perennial, stems erect or ascending, 15-40 cm high, densely lanate. **Fruits achenes, cylindric, apex with pappus, base narrowed, 1.2-1.5 x 0.35-0.45 mm. Surface grained, whitish papillose-tuberculate, brown to dark-brown.** Native to Greece, seldom cultivated as an ornamental summer plant in gardens.

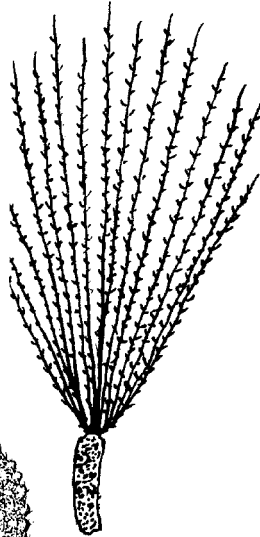
**3411. *Anaphalis margaritacea* (L.) Benth. et Hook., *Gnaphalium margaritaceum* L.** — Perennial, up to 30-80 cm high, white lanate, unbranched except the inflorescence. **Fruits achenes, cylindric, apex with whitish pappus, base narrowed into small hilum, c. 0.8 x 0.3 mm. Surface smooth, with whitish hairs, brown. 2n = 28.** Originally growing in North America; often cultivated as a permanent ornamental plant in gardens, sometimes naturalized in mountain areas. Pl, Ro, Sk.

**3412. *Helipterum roseum* Benth., *Acroclonium roseum* hort.** — Perennial, up to 100 cm high, stems erect, branched only in inflorescence. **Fruits achenes, cylindric, obovate or 5-angular with white pappus, bristles ended with dark-brown crestlets, 6.5-7.5 x 3.2-3.7 mm. Surface very dense covered with white hairs.** Originally growing in Australia; in the Carpathians rarely cultivated as an ornamental permanent plant in gardens.

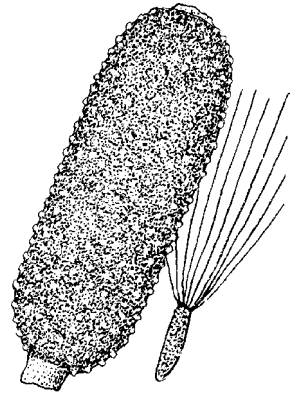
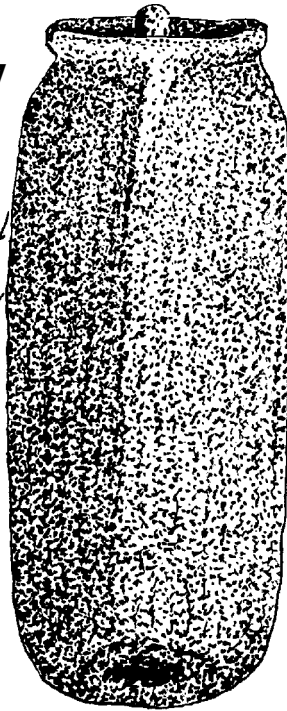
**3413. *Rhodante manglesii* (O. F. Müll.) Lindl, *Helipterum manglesii* O. F. Müll.** — Annual, stems erect, glabrous, little crestedly ramified. **Fruits achenes, obovoid, apex with white pappus, distinct narrowed toward base, 2.2-2.6 x 1.1-1.3 mm. Surface dense covered with white long hairs. 2n = 22.** Originally growing in Australia; in the Carpathians cultivated as an ornamental in gardens under the name Australian straw-flower.



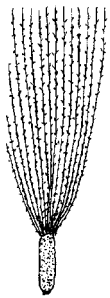
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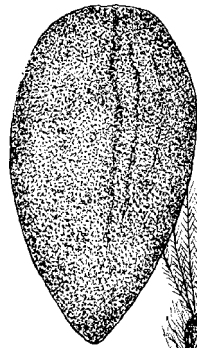
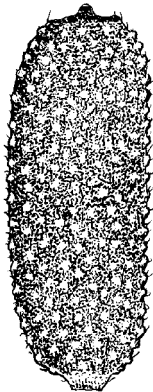
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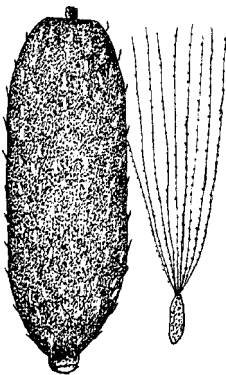
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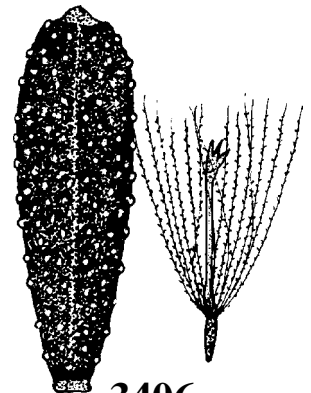
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**3414. *Ammobium alatum*** R. Br. — Annual to perennial, stems up to 50 cm high, twiglets winged, ramified. **Fruits achenes, prismatic with membranous collar at apex, slight gradually narrowed toward base, 3.7-4.3 x 0.8-1 mm. Surface faint sinuate, glabrous, dull, dark reddish-brown. 2n = 26.** Originally growing in Australia; in the Carpathians cultivated as a Straw-flower for ornament.

**3415. *Antennaria carpatica*** (Wahlenb.) Bluff et Fingerh., *Gnaphalium carpaticum* Wahlenb. — Perennial, up to 10-20 cm high, stems erect, unbranched, leafy. **Fruits achenes, ellipsoid or obovoid, apex with white pappus, mostly gradually narrowed toward base, with white hilum, 1.5-1.7 x 0.35-0.45 mm. Surface fine longitudinal grooved, scarce white-hairy, greyish-brown. 2n = 56.** Native to the high mountains of Europe, calcite rocks and mountain meadows. Pl, Ro, Sk, Uk.

**3416. *Antennaria dioica*** (L.) Gaertn., *Gnaphalium dioicum* L. — Perennial, up to 10-25 cm high, stems erect, leafy, only above crestedly ramified. **Fruits achenes, cylindric, apex with whitish pappus, base lower and narrower with white hilum, 1.1-1.3 x 0.3-0.4 mm. Surface fine longitudinal grooved, with short white hairs or papillae, brown. 2n = 28.** Native to Eurasia, meadows, pastures, light forests and shrubberies. Br, Hu, Pl, Ro, Sk, Uk.

**3417. *Leontopodium alpinum*** Cass., *Gnaphalium leontopodium* Scop. — Perennial, densely whitish lanate, flowering stems erect, 5-30 cm high, unramified. **Fruits achenes, cylindric or obovoid, apex with white pappus, gradually narrowed toward base into white hilum, 1.5-1.8 x 0.6-0.7 mm. Surface smooth with short white hairs, dull, greyish-brown. 2n = 52.** Native to Europe and central Asia, on calcite rocks. Hu, Pl, Ro, Sk, Uk.

**3418. *Inula bifrons*** (Gou.) L., *I. glabra* Bess. — Perennial, up to 40-110 cm high, stems erect, stout, ramified above, glandular at knobs. **Fruits achenes, ellipsoid, apex with yellowish pappus, gradually narrowed toward base into hilum, 2-2.5 x 0.5-0.6 mm. Surface longitudinal deeply furrowed and ribbed with short white hairs at ribs, dull, brown.** Native to southern Europe, borders of shrubberies, along fences, forest margins. Ro.

**3419. *Inula britannica*** L. — Biennial to perennial, adpressed lanate up to glabrous, stems erect, 20-70 cm, simple or little branched. **Fruits achenes,**

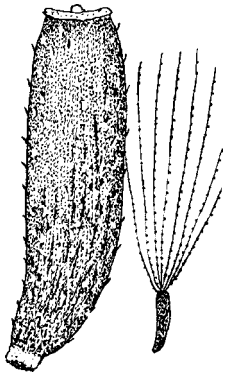
**ellipsoid or obovoid, with yellowish pappus at apex, narrowed toward base into hilum, 1.4-1.6 x 0.5-0.6 mm. Surface deeply furrowed and ribbed, with short white hairs at ribs, dull, brown. 2n = 32.** Native to Eurasia, orchards, gardens, pastures, cut-over areas, along ways, cultivated places. Hu, Mo, Pl, Ro, Sk, Uk.

**3420. *Inula conyza*** DC., *I. vulgaris* (Lam.) Trev. — Perennial, pubescent up to tomentose, 30-120 cm, stems erect, woody below, broomy ramified above. **Fruits achenes, cylindric, apex with yellowish-white pappus, gradually narrowed toward base, often bended in lower part, 1.7-2.2 x 0.5-0.6 mm. Surface longitudinal furrowed and ribbed, with short white hairs at ribs, dull, dark-brown. 2n = 32.** Native to Europe, shrubby and stony slopes, light forests, cut-over areas, margins and scrubs. Hu, Mo, Pl, Ro, Sk, Uk.

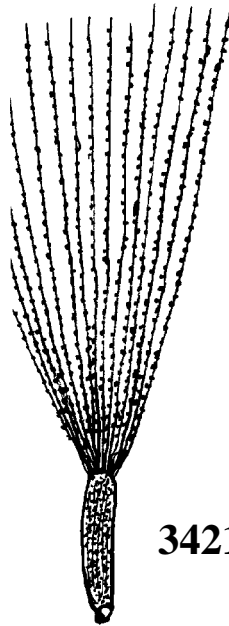
**3421. *Inula ensifolia*** L. — Perennial, up to 10-60 cm high, lanate, stems erect, mostly unramified. **Fruits achenes, cylindric, apex with whitish pappus, slight narrowed toward base into hilum, 1.8-2.2 x 0.5-0.6 mm. Surface longitudinal furrowed and ribbed, without hairs at ribs, dull, dark-brown, ribs pale-brown. 2n = 16.** Native to Eurasia, steppe stony slopes and steppe forests. Hu, Mo, Pl, Ro, Sk, Uk.

**3422. *Inula germanica*** L. — Perennial, up to 30-60 cm high, downy, scaly at base, stem erect or ascending, unbranched, densely leafy. **Fruits achenes, cylindric or prolonged obovoid, apex with pale-brown pappus, gradually narrowed toward base into hilum, 1.3-1.7 x 0.4-0.5 mm. Surface longitudinal furrowed and ribbed, without hairs at ribs, dull, dark-brown, ribs pale-brown. 2n = 16.** Native to Eurasia, grassy places, sunny shrubby slopes, forest steppes and margins of warmer areas; in all Carpathian territories.

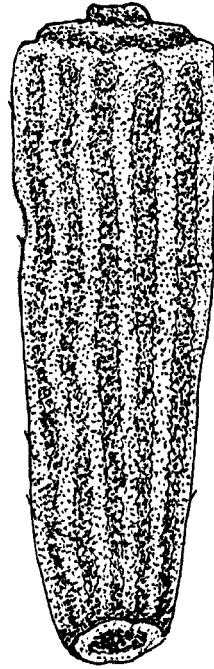
**3423. *Inula helenium*** L., *Convisartia helenium* Mérat — Perennial, up to 60-250 cm high, robust, hirsute, stem stiff, erect, grooved, little ramified above. **Fruits achenes, cylindric, 4-5-angular, apex with pale-brown pappus, with bristles of two lengths, base truncate, 4-5 x 0.8-1 mm. Surface longitudinal shallow furrowed and ribbed, with adjacent short white hairs at ribs, slight lustrous, brown. 2n = 20.** Native to western and central Asia; in the Carpathians since old times cultivated as



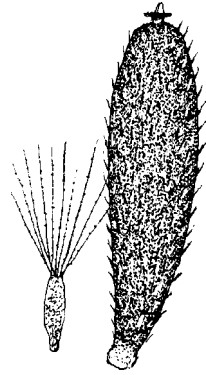
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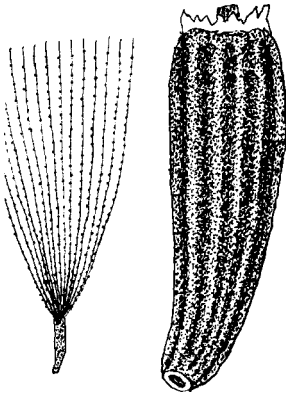
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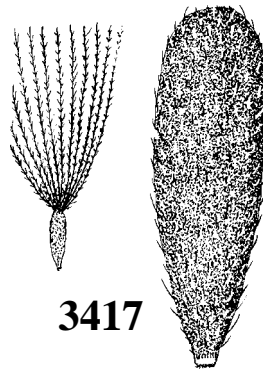
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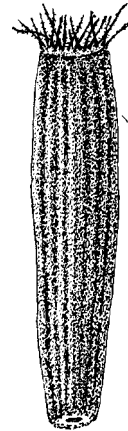
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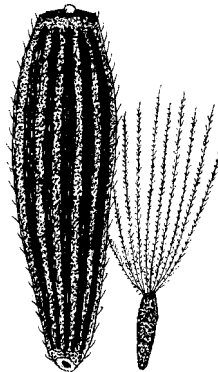
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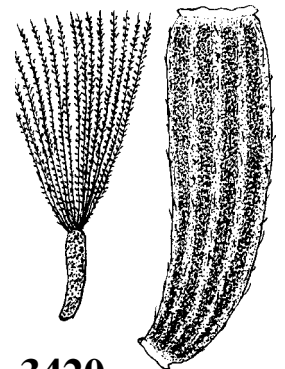
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the medicinal plant, locally naturalized. Hu, Mo, Pl, Ro, Uk.

**3424. *Inula hirta* L., *I. montana* auct.** — Perennial, stems erect, 15-50 cm high, roughly hirsute, unramified, or with 1-3 one-flower-headed twiglets. **Fruits achenes, ellipsoid, apex truncate with yellowish-brown pappus, base narrowed into hilum, 1.8-2.2 x 0.5-0.6 mm. Surface longitudinal furrowed and ribbed, sparse hairy at ribs, slight lustrous, reddish-brown. 2n = 16.** Native to Euro-Siberia, steppe and dry stony slopes, woody steppes, forest margins and karst steppes; in all Carpathian territories.

**3425. *Inula oculus-christi* L.** — Perennial, adpressed downy-lanate, stems erect, 15-30 cm, simple or little crestedly ramified. **Fruits achenes, cylindric or gradually narrowed toward base, apex truncate with white pappus, 2-2.5 x 0.4-0.6 mm. Surface longitudinal furrowed and ribbed, with short hairs at ribs, sometimes with appressed long hairs, slight lustrous, brown. 2n = 32.** Native to Eurasia, sunny stony and shrubby slopes, forest steppes. Br, Hu, Mo, Ro, Sk, Uk.

**3426. *Inula salicina* L.** — Perennial, stems stiff, erect, 20-80 cm high, unramified, scarce pubescent or glabrous below, bristly. **Fruits achenes, cylindric, apex truncate with white pappus, base narrowed, 1.4-1.7 x 0.4-0.5 mm. Surface longitudinal furrowed and ribbed, without hairs at ribs, slight lustrous, dark-brown. 2n = 16.** Native to Eurasia, sunny stony slopes, grassy downs and saline meadows. Hu, Mo, Pl, Ro, Sk, Uk.

**3427. *Inula spiraeifolia* L., *I. bubonium* Jacq.** — Perennial, up to 30-80 cm high, stout, erect, angular, pubescent, tufted, branched. **Fruits achenes, cylindric, apex truncate with yellowish-white pappus, straight or slight bended below, 2.2-2.5 x 0.5-0.6 mm. Surface longitudinal furrowed and ribbed, without hairs at ribs, slight lustrous, reddish-brown.** Native to western and southern Europe (Alps), stony, sunny and shrubby areas. Hu, Ro (?).

**3428. *Pulicaria dysenterica* (L.) Bernh., *Inula dysenterica* L.** — Perennial, stems erect, 20-60 cm high, ramified above. **Fruits achenes, ellipsoidal, apex truncate with yellowish-white pappus and whitish collar, base rounded with whitish hilum, 1.1-1.5 x 0.3-0.4 mm. Surface with longitudinal ribs, sparsely hairy, slight lustrous, reddish-brown.**

**2n = 18, 20.** Native to Eurasia, wet meadows, pastures, woodlands and river-banks; in all Carpathian territories.

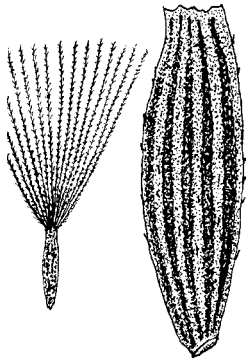
**3429. *Pulicaria vulgaris* Gaertn., *P. prostrata* Asch., *Inula pulicaria* L.** — Annual to biennial, hirsute, stems erect or ascending, 10-40 cm high, ramified below. **Fruits achenes, cylindric, apex with whitish-brown pappus, external row of scales up to half grooved into collar, base narrowed, 1.5-1.8 x 0.3-0.4 mm. Surface smooth with long white appressed hairs, slight lustrous, dark-brown. 2n = 18.** Native to Eurasia, river- and ditch-banks, roads, pastures, in overflowing areas; throughout the Carpathians.

**3430. *Heliopsis helianthoides* (L.) Sweet, *H. scabra* Torr. et Grey, *Helianthus laevis* L. non all.** — Perennial, stems 1-1.5 m high, bare, rough, simple or branched, leaves oblong ovoid, on base truncate, dentate, flowers gold-yellow. **Fruits achenes, quadrangular, apex truncate without pappus, bottom slight narrowed, 5-5.6 x 2-2.2 mm. Surface smooth, lustreless, pale- or dark-brown.** Native to North America; in the Carpathians often cultivated as ornamental in gardens, rarely escaping. Uk.

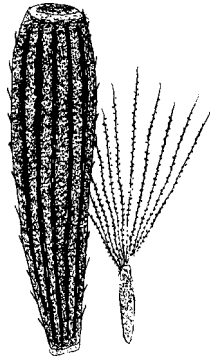
**3431. *Bupthalmum salicifolium* L.** — Perennial, up to 20-70 cm high, hirsute, stems erect, simple or with some one-flower-headed twiglets. **Fruits achenes of two-faces: target seeds 4- or poly-angular, 2.8-3.2 x 1.6-1.8 mm (left); border seeds 3-angular, 2.8-3.2 x 1-1.2 mm (right), both with tooth-leafed collar at apex, without pappus and distinct lateral wings. Surface glabrous, slight lustrous, pale yellowish-brown. 2n = 20.** Native to Europe, light woods and shrubberies. Hu.

**3432. *Carpesium cernuum* L.** — Annual to biennial, adpressed hirsute and glandular, stem 20-80 cm, erect, ramified above. **Fruits achenes, ellipsoid, apex prolonged into a neck, base narrowed, truncate, 3.5-4.5 x 0.6-0.8 mm. Surface longitudinal furrowed and ribbed, lustreless, pale-brown. 2n = 40.** Native to Eurasia, light, wet forests, scrubs and cut-over areas. Hu, Mo, Pl, Ro, Sk, Uk.

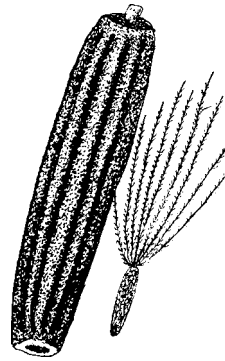
**3433. *Telekia speciosa* (Schreb.) Baumg., *Bupthalmum speciosum* Schreb.** — Perennial, robust, stems 1-2 m high, little branched above, pubescent. **Fruits achenes, cylindric with longitudinal furrows, with tooth-leafed collar at apex, 3.3-3.7 x 0.7-0.8 mm. Surface glabrous, dull, yellowish-brown. 2n = 20.**



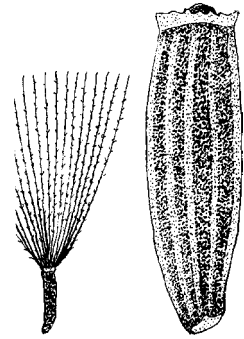
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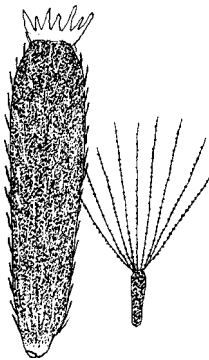
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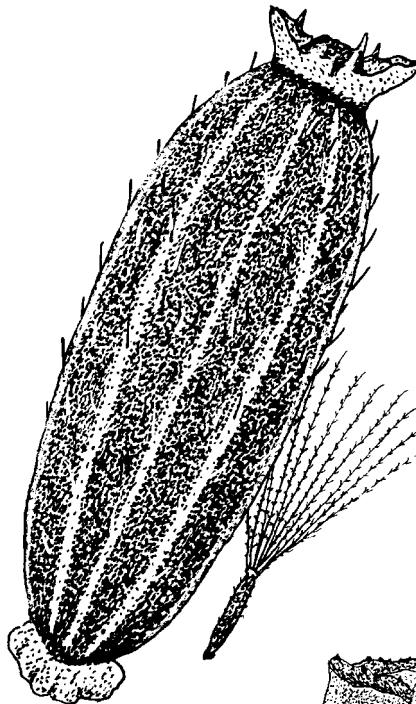
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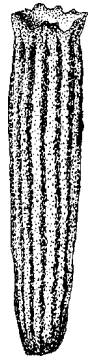
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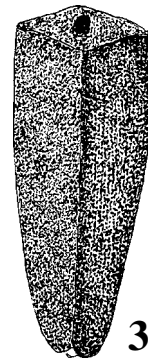
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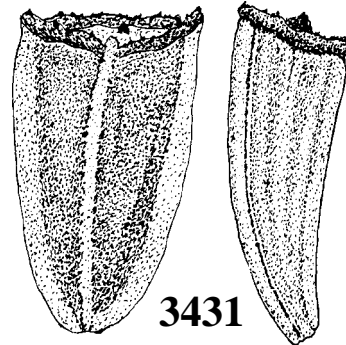
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Native to Europe, coastal scrubs, forest clearings on calcareous to neutral grounds. Hu, Mo, Pl, Ro, Sk, Uk.

**3434. *Guizotia abyssinica*** (L. fil.) Cass., *G. oleifera* DC. — Annual, stems erect, 0.5-2 m high, forkedly ramified. **Fruits achenes, prismatic, 4-angular, apex truncate, gradually narrowed toward base and  $\pm$  curved below or straight, 4.5-5 x 1.4-1.6 mm. Surface longitudinal furrowed, lustrous, brownish-black to black.  $2n = 30$ .** Originally growing in eastern Africa; in the Carpathians cultivated as an oil-bearing plant in the past, rarely hauling.

**3435. *Bidens cernua*** L., *B. minima* L. — Annual, glabrous or pubescent, stems 10-90 cm high, erect. **Fruits achenes, rumpled, flattish, cuneiform, target achenes 4-angular, border achenes 3-angular, back bristles at edges, apex with 4 (3) spines, 5.8-6.6 x 2.4-3 mm. Surface smooth or longitudinal furrowed, with few rounded warts, greyish-brown.  $2n = 24$ .** Native to Eurasia and North America, river-banks, pools and trenches, occasionally overflowed or permanently wet stands; throughout the Carpathians.

**3436. *Bidens connata*** Mühlenb. ex Willd., *B. decipiens* Warnst. — Annual,  $\pm$  glabrous, stem erect, 20-100 cm high, ramified from base, often brownish-violet. **Fruits achenes, cuneiform, flattish, with 4 (3) spines at apex, target achenes 4-angular, border achenes 3-angular, 6.2-7 x 2-2.5 mm. Surface warty, dull, greyish-brown.** Native to North America; hauling into the Carpathians, naturalized in moist to wet places in particular. Pl, Ro.

**3437. *Bidens frondosa*** L., *B. melanocarpa* Wiegand — Annual, glabrous, stem erect, 10-100 cm high, unbranched, angular, hirsute at knots. **Fruits achenes, cuneiform or obovoid, flattish, two spines with back-bristles at apex, 8-10 x 3.2-4 mm. Surface warty and faint longitudinal furrowed (on ventral side), brown.  $2n = 48$ .** Originally growing in North America; hauling into the Carpathians in waste places, on river-banks and railway stations, naturalized in many places. Pl, Ro, Sk, Uk.

**3438. *Bidens pilosa*** L. — *B. leucanthus* Poepp. — Annual, glabrous, hirsute, stems erect, 20-80 cm high. **Fruits achenes, prolonged, narrow fusiform, flattish, apex with 3 (2) spines, scarce bristles only at edges, 1.3-1.5 x 0.7-0.8 mm. Surface papillate or smooth, dull, black, the apex and spines**

**pinkish-brown.  $2n = 72$ .** Originally growing in South America; uniquely hauling into the Carpathians.

**3439. *Bidens radiata*** Thuill. — Annual, stems simple, erect, ramified, 50-100 cm. **Fruits achenes, cuneiform or obovoid, flattish, target achenes 4-angular, with 2 (4) back bristle spines at apex, 5-8 x 2-3 mm. Surface warty at edges with fine thornlets, dull or slight lustrous, greyish-brown.  $2n = 48$ .** Native to Eurasia, swampy river-banks, denuded lake bottoms; very probably hauling into the Carpathians. Mo, Pl, Sk, Uk.

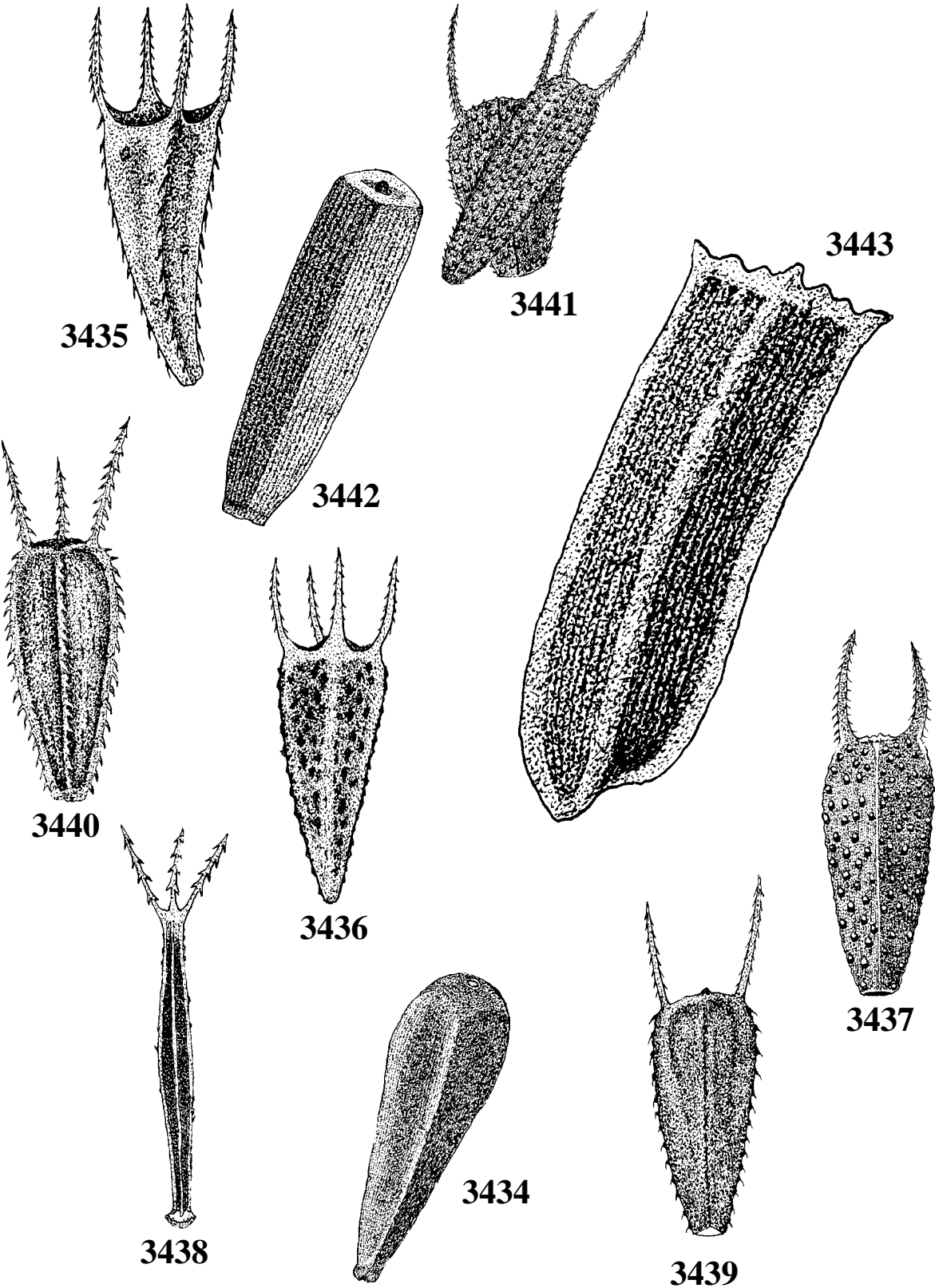
**3440. *Bidens tripartita*** L., *B. pumila* (Roth.) Gaertn. — Annual, glabrous or hirsute, stems erect, 10-100 cm high, often reddish. **Fruits achenes, flattish, 4-angular, prolonged, obovoid or cuneiform, apex with 3 spines, spines back-bristle at edges, 7-7.8 x 2.2-2.6 mm. Surface wrinkly or longitudinal shallow furrowed, brown.  $2n = 48$ .** Native to Eurasia, wet and swampy river-banks, waste places, trenches, lowland woods; commonly found in all Carpathian territories.

**3441. *Bidens vulgata*** E. L. Greene — Perennial, very similar to *B. frondosa*, with 10-16 hispid-ciliate outer involucre bracts. **Fruits achenes, oblong-obovoid, lateral compressed, apex having two spines with deflexed bristles, 10.5-11.5 x 4-4.5 mm marginal, 7.5-8.5 x 4-5 mm inner fruits; achenes with marginal bristles erect or patent in the lower 3/4 and deflexed in the upper 1/4. Surface verruculose, lustreless, brown.** Native to North America; occasionally hauling and sometimes naturalized in the Carpathians. Ro.

**3442. *Rudbeckia hirta*** L. — Annual to perennial, furled up to bristly hirsute, stems erect, 30-100 cm high, simple or little branched. **Fruits achenes, cylindric, 4-angular, apex truncate without pappus, base slight narrowed and truncate, 2-2.6 x 0.6-0.7 mm. Surface longitudinal shallow furrowed, smooth, dark-grey to blackish.  $2n = 38$ .** Originally growing in North America; in the Carpathians often cultivated as an ornamental permanent plant in full-blossom cvs. Hu, Mo, Pl, Uk.

**3443. *Rudbeckia laciniata*** L. — Perennial, glabrous, greyish-green, stems erect, 50-250 cm high, ramified above. **Fruits achenes, prismatic, apex with tooth-leaved collar, edges winged, 4.5-5.5 x 1.5-1.8 mm. Surface longitudinal shallow furrowed, glabrous, brown.  $2n = 76$ .** Originally growing in North





America; in the Carpathians often cultivated in parks, gardens in some cvs and naturalized in lowland woods and along railways. Hu, Mo, Pl, Ro, Uk.

**3444. *Rudbeckia nitida*** Nutt. — Stems 8-150 cm, leaves undivided ovoid-lanceolate, flowers, bright-yellow. **Fruits achenes, quadrangular, apex truncate without pappus, rounded at base, edges slight winged, 4.4-5 x 1.2-1.5 mm. Surface longitudinal and shallow furrowed, faint lustrous, dark-brown.** Native to North America, grows in moist shrubberies; in the Carpathians rarely cultivated in natural parks.

**3445. *Rudbeckia pinnata*** Vent. — Perennial, roughly and bristly hairy, stem erect, 40-100 cm high. **Fruits achenes, shield-like, compressed, sharp angular, apex truncate, base rounded, lateral edges winged, 2.5-2.7 x 1.4-1.6 mm. Surface longitudinal shallow furrowed, glabrous, dark-greyish to blackish.** Originally growing in North America; in the Carpathians rarely cultivated in some full-blossom cvs in gardens and uniquely naturalized in coastal scrubs.

**3446. *Rudbeckia purpurea*** (L.) Moench — Perennial, up to 60-150 cm high, glabrous. **Fruits achenes, cuneiform, 4-angular, wings angles indistinct or minute, 4-6 x 2-2.6 mm. Surface smooth or slight longitudinal furrowed, dull, pinkish-brown.** Native to North America; in the Carpathians rarely cultivated for ornament in gardens.

**3447. *Rudbeckia speciosa*** Wender. — Perennial, plant appressed hirsute or nearly bare, stems 50-70 cm high, branched from base, leaves lanceolate, irregularly dentate. **Fruits achenes, tetragonal, 4-angular with 3-4 furrows on each side, pappus pappus very short and quick to subside, 2.4-2.6 x 0.7-0.8 mm. Surface furrowed, slight lustrous, dark-grey to black.** Native to North America, growing in moist soils; in the Carpathians cultivated as one of the nicest *Asteraceae* species in gardens and parks. Mo, Uk.

**3448. *Helianthus annuus*** L. — Annual, up to 3 m high, stem mostly unbranched. **Fruits achenes, obovoid, apex truncate, toward base gradually narrowed, 9-11 x 5.5-6.5 mm (majority of cvs). Surface glabrous, smooth, dull or slight lustrous, mostly dirty-white, grey or combination of both. 2n = 34.** Originally growing in North America, for many years cultivated in fields as a very important oil plant, temporarily naturalized in waste places and compost heaps; in all Carpathian regions.

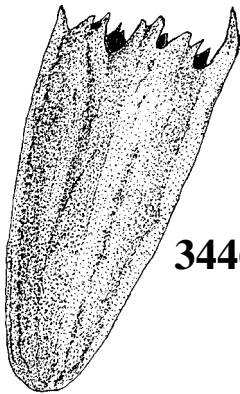
**3449. *Helianthus debilis*** Nutt., *H. cucumeriformis* hort. — Annual, stems 40-100 cm high, tender, decumbent or ascending, extending at base, densely branched, hirsute. **Fruits achenes, cuneiform, apex truncate, bottom gradually narrowed, hilum white-hemmed, 4.5-5.1 x 1.9-2.1 mm. Surface longitudinal fine furrowed, minute hirsute, lustreless, blackish-brown to black.** Native to North America; in the Carpathians often cultivated as an ornamental. Ro, Sk.

**3450. *Helianthus decapetalus*** L., *H. multiflorus* hort. — Perennial, stems erect, 1-2 m high, glabrous, branched, twigs thin, leaves oval-ovoid, sharply dentate, flowers numerous, small (up to 6 cm in diam.). **Fruits achenes, obovoid, lateral compressed, apex ± truncate with a small beak, bottom narrowed, 4-4.5 x 2.4-2.7 mm. Surface longitudinal faint straight, lustreless, pale-brown, with blackish wave-like drawings.** Native to North America; in the Carpathians sporadically cultivated for ornament. Ro.

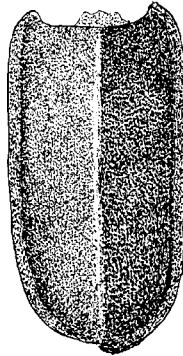
**3451. *Helianthus orgyalis*** DC., *H. salicifolius* hort. — Perennial, stems procumbent unbranched, densely leafy at base, caespitose, flowering in autumn, 150-250 cm high. **Fruits achenes, oblong obovoid, lateral flattish, apex truncate, bottom gradually narrowed, 3.8-4.2 x 1.6-1.8 mm. Surface glabrous, slight lustrous, dark-grey, fine spotted.** Native to North America, dry slopes; in the Carpathians cultivated as a solitary or in small groups; very decorative in gardens and parks.

**3452. *Helianthus rigidus*** (Cass.) Desf., *H. scaberrimus* Michx. non L. nec Lam., *H. crassifolius* Nutt. — Perennial, stems stiff, erect, 1-2 m high, leaves leathery, inflorescence single, 5-10 cm in diam. **Fruits achenes, oblong-obovoid, lateral compressed, apex truncate with 2 or 4 scales, bottom narrowed, rounded, 4.2-5 x 1.8-2.2 mm. Surface longitudinal shallow furrowed, faint lustrous, greyish, blackish or brownish, wavyly spotted. 2n = 102.** Native to North America; rarely hauling into the Carpathians. Sk.

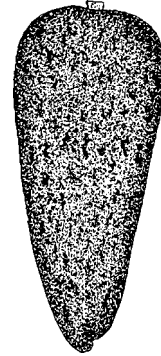
**3453. *Helianthus salicifolius*** Dietr. — Perennial, stems 1-2 m high, with linear or nearly filiform-bended leaves. **Fruits achenes, oblong-obovoid, lateral compressed, 3.8-4.3 x 1.6-1.8 mm. Surface longitudinal shallow furrowed, lustreless, spotted, grey or greyish-brown.** Native to North America; in the Carpathians



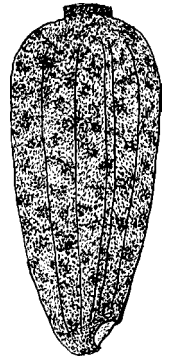
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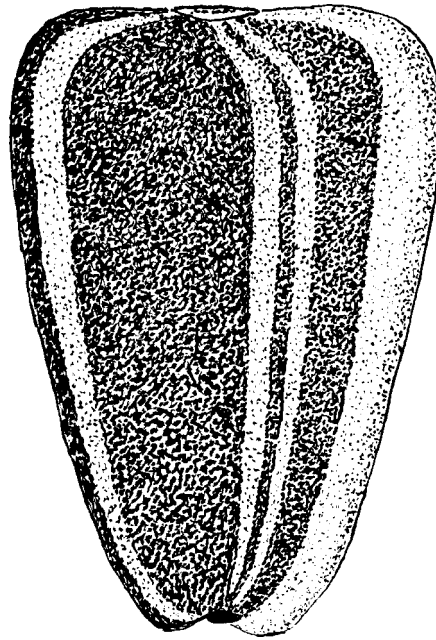
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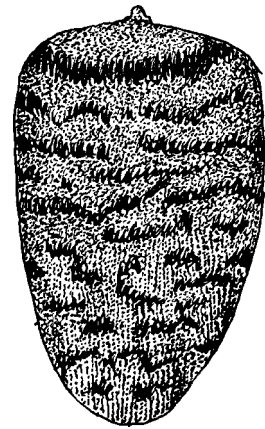
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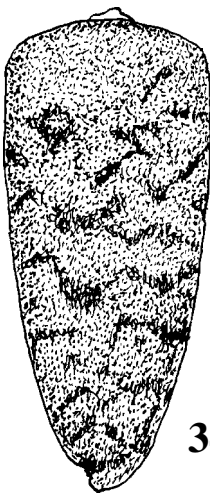
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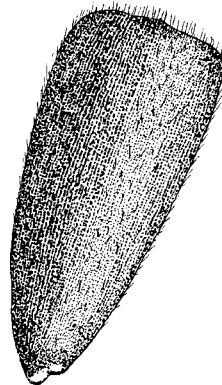
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3452



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3444

rarely cultivated in gardens and parks as an ornamental. Uk.

**3454. *Helianthus tuberosus* L., *H. decapetalus* auct. non L.** — Perennial, stem 50-250 cm high, erect, glabrous or roughly hirsute, ramified above. **Fruits achenes, obovoid, apex truncate, gradually narrowed toward base, 6.5-7.5 x 4.5-5 mm. Surface smooth, glabrous, slight lustrous, mostly dark-grey to blackish.  $2n = 102$ .** Originally growing in North America; in the Carpathians cultivated mostly in small extent for fodder (green mass) or food (bulbs). Hu, Mo, Pl, Ro, Sk, Uk.

**3455. *Helianthus x laetiflorus* Pers.** — Perennial, stems 1-2.5 m high, leaves broadly lanceolate, 3-veined below, very scabrid on both surfaces, the upper leaves much smaller. **Fruits achenes, oblong-obovoid, lateral flattish, apex truncate with small beak, 4.2-4.8 x 1.8-2.2 mm. Surface greyish-brown with wavelike spots, faint lustrous.** Hybrid *H. rigidus* x *tuberosus*; in the Carpathians rarely cultivated in flower-beds for ornament and naturalized in waste-places. Uk.

**3456. *Helenium autumnale* L.** — Perennial, up to 60-160 cm high, stems erect or ascending, winged, tufted branched above. **Fruits achenes, cylindrical, apex truncate with membranous, crenulate scales, base rounded, 1.3-1.5 x 0.5-0.6 mm. Surface smooth, scarce warty, hairy at ridges, dull, reddish-brown.** Originally growing in North America, thrives in lowland mixed forests; in the Carpathians rarely cultivated as ornamental in gardens. Hu.

**3457. *Helenium nudiflorum* Nutt.** — Perennial, up to 60-100 cm high, stems erect, winged, branched above. **Fruits achenes, obovoid, apex truncate with white membranous crenulation scales, toward base gradually narrowed, 1.7-1.9 x 0.5-0.6 mm. Surface glabrous, dense hairy on ribs, dull, brown.** Native to North America; introduced and cultivated into Europe, including the Carpathians, as ornamental plant in gardens and parks.

**3458. *Cosmos bipinnatus* Cav.** — Annual, stem erect, up to 1 m high, ramified above, shortly pubescent. **Fruits achenes, cuneiform, convex and warty on dorsal side, flat with deep groove on ventral side, apex narrowed into slender neck, rostrate, mostly bended, gradually narrowed toward base, 8-10 x 1.3-1.5 mm. Surface dull, pale-brown.**

**$2n = 24$ .** Originally growing in North America; in the Carpathians commonly cultivated as an ornamental summer plant in gardens. Hu, Mo, Ro, Sk, Uk.

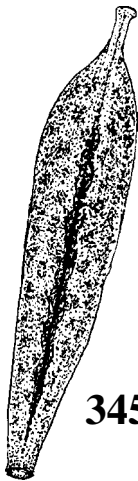
**3459. *Argyranthemum frutescens* (L.) Sch.-Bip.** — Semishrub, with oblong paddle-shaped leaves, twigs branched above, 30-100 cm high. **Fruits achenes, obprismatic, apex and bottom truncate, apex with dentate flocculus, 2.6-3 x 0.8-1 mm. Surface longitudinal furrowed and ribbed, lustrous, whitish, violetish or light-brown.** Native to the Canary Islands; in the Carpathians rarely cultivated in flowerpots, in orangeries or interiors. Uk.

**3460. *Zinnia elegans* Jacq.** — Annual, up to 30-100 cm high, stem erect, simple or ramified, hirsute, leafy. **Fruits achenes, obovoid or prolonged cordiform, 3-angular, flattish, lateral winged, 8.5-9.5 x 4.3-4.7 mm. Surface slight longitudinal furrowed, faint warty, lustreless, brown.  $2n = 24$ .** Originally growing in Mexico; commonly cultivated as an ornamental summer plant in many cvs in gardens. Hu, Mo, Ro, Sk, Uk.

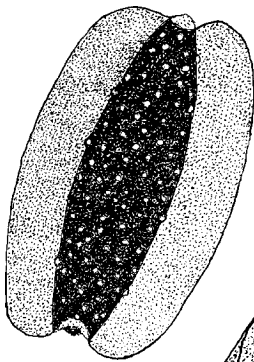
**3461. *Coreopsis grandiflora* Nutt.** — Perennial, up to 80-100 cm high, erect, scarce ramified. **Fruits achenes, nearly globose with membranous lateral wings, dorsal side convex, smooth, ventral concave and warty, 2.9-3.3 x 3.7-4.3 mm. Surface glabrous, dull, blackish-brown, wings purplish-brown.** Originally growing in North America, moist stands; in the Carpathians cultivated for ornament in gardens. Hu, Mo, Uk.

**3462. *Coreopsis lanceolata* L., *Chrysomelea lanceolata* (L.) Tausch.** — Perennial, up to 40-70 cm high, little branched. **Fruits achenes, globose or ellipsoid with lateral wings, dorsal side convex, ventral strong concave, 2.7-3.3 x 3.7-4.3 mm. Surface smooth or warty on one or both sides, dark to blackish-brown, wings purplish-brown.  $2n = 24, 26, 48$ .** Originally growing in North America; in the Carpathians rarely cultivated as an ornamental plant in gardens.

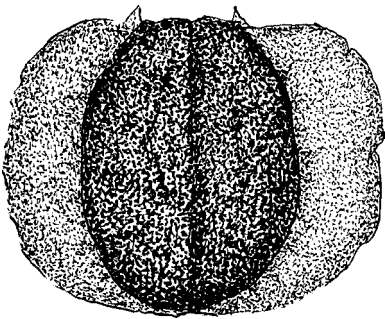
**3463. *Coreopsis tinctoria* Nutt., *C. elegans* hort., *Calliopsis bicolor* Rehb.** — Annual, glabrous, stem erect, 30-100 cm high, much ramified below. **Fruits achenes, ellipsoid, compressed, dorsal side convex, ventral concave with longitudinal ridge, lateral margins with yellowish wings, 2.5-3.5 x 1.7-2 mm. Surface granular, dull or slight lustrous, black,**



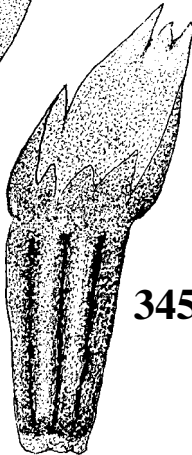
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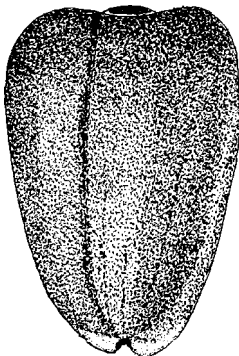
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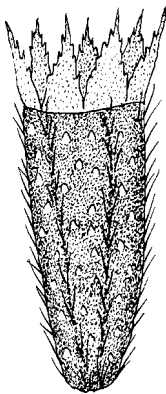
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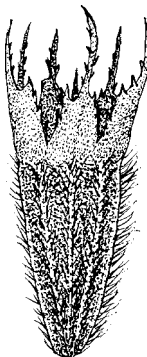
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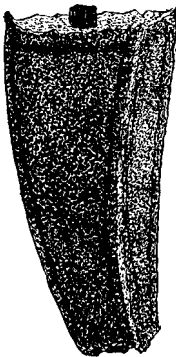
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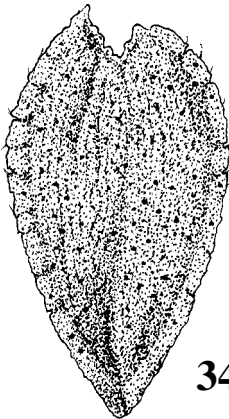
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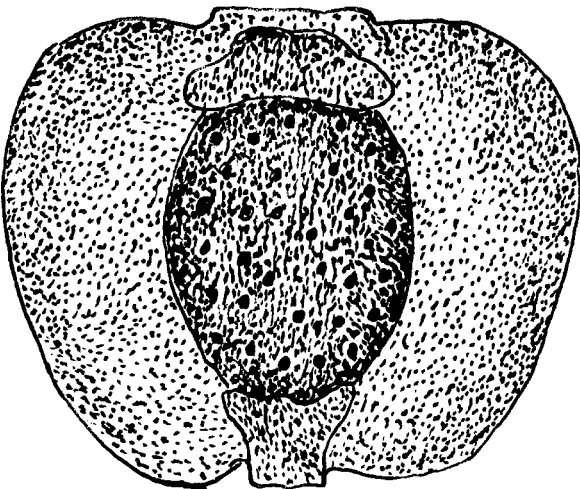
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3461

**dorsal side yellowish warty. 2n = 24.** Native to North America; in the Carpathians commonly cultivated for ornament in gardens. Hu, Mo, Ro, Uk.

**3464. *Coreopsis verticillata* L.** — Perennial, up to 40-60 cm high, stems erect, densely branched. **Fruits achenes, obovoid, flattish, dorsal side convex, ventral concave, with broad membranous lateral wings, 3.7-4.3 x 2.2-2.7 mm. Surface fine longitudinal furrowed, glabrous, dark-brown, wings yellowish-brown.** Originally growing in North America; often cultivated in gardens as an ornamental perennial plant.

**3465. *Verbesina occidentalis* (L.) Walt., *Sigesbeckia occidentalis* L.** — Annual, up to 100-200 cm high, stems narrowly 4-winged. **Fruits achenes, prolonged cordate, with two spines at apex, gradually narrowed toward base, lateral winged, 5.3-6 x 3.5-4 mm. Surface warty and fine prickly, dull, brown, wings lustrous, yellowish-white. 2n = 34.** Originally growing in North America; in the Carpathians rarely cultivated as a summer plant in gardens.

**3466. *Sigesbeckia orientalis* L.** — Annual, up to 60-150 cm high, stems erect, glabrous above, pubescent below, ramified. **Fruits achenes, prismatic, 4-angular, arcuately bended, 3-3.5 x 1.4-1.7 mm. Surface fine longitudinal striate and scarce warty, dull, blackish- or greyish-brown.** Native to Europe, in warmer areas, ruderal grounds, along railways and stands of *Robinia pseudoacacia*. Ro, Uk.

**3467. *Dahlia coccinea* Cav.** — Perennial, stems and leaves hoary, erect, ramified above. **Fruits achenes, clavate, strong compressed, dorsal side convex, ventral concave, apex and base narrowed, 10-11 x 3.4-3.8 mm. Surface longitudinal striate and scarce warty, dull, dark-brown. 2n = 32, 64.** Native to central America, mother species of many cvs cultivated as ornamental in gardens.

**3468. *Dahlia pinnata* Cav., *D. variabilis* (Willd.) Desf.** — Perennial, up to 180 cm high, erect, ramified above. **Fruits achenes, clavate, flattish, dorsal side convex, ventral concave, lower part narrowed, 10.5-11.5 x 3-4 mm. Surface longitudinal fine furrowed, scarce warty, dull, brown. 2n = 32, 64.** Originally growing in North America; in the Carpathians commonly cultivated as ornamental in gardens and parks, in numerous cvs. Uk.

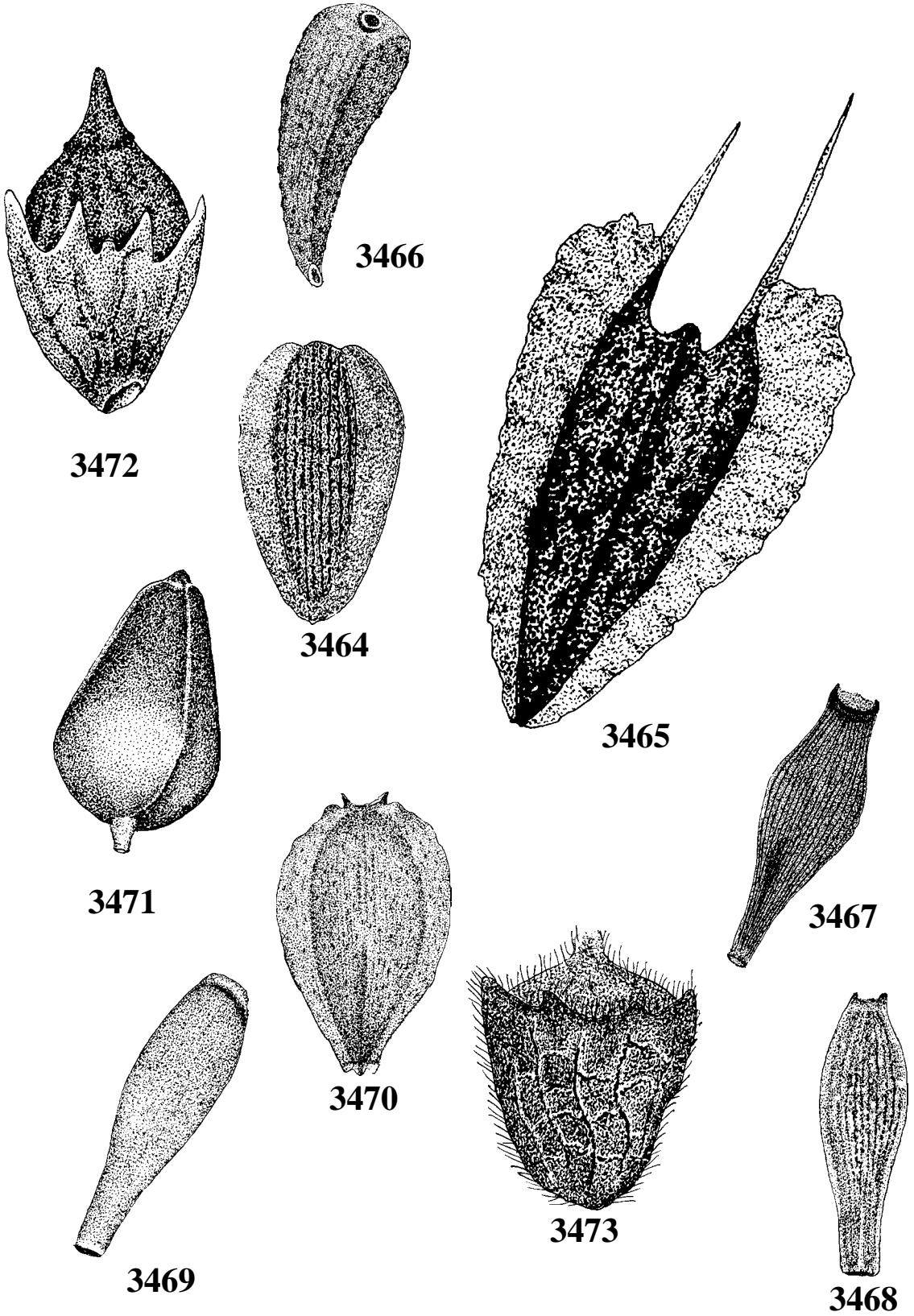
**3469. *Dahlia rosea* Cav.** — Perennial, up to 60-150 cm high, ramified. **Fruits achenes, clavate, flattish, dorsal side convex, ventral concave, apex rounded and winged, lower part narrowed, 9.5-10.5 x 2.8-3.3 mm. Surface fine furrowed, glabrous, brown. 2n = 64.** Originally growing in North America; in the Carpathians rarely cultivated for ornament in gardens.

**3470. *Silphium perfoliatum* L.** — Perennial, stout, ramified below, stems erect, 100-150 cm high, 4-angular, hirsute, seldom glabrous. **Fruits achenes, obovoid, strong flattish, gradually narrowed in lower part, broad winged, 10-13 x 6-7 mm. Surface distinct or indistinct longitudinal furrowed, scarce faint tuberculate, lustrous, brown, wings pale. 2n = 14.** Originally growing in North America; in the Carpathians sometimes cultivated as ornamental in gardens.

**3471. *Iva xanthifolia* Nutt., *Cyclachaena xanthifolia* (Nutt.) Fresen.** — Annual, up to 1-2 m high, glabrous or hirsute. **Fruits achenes, obovoid, slight compressed, apex rounded with beak above, gradually broad toward base, 1.8-2.2 x 1.1-1.3 mm. Surface longitudinal fine granular, lustreless, dark-grey. 2n = 36.** Originally growing in North America; hauling into waste grounds, railway embankments and fully naturalized in large part of the Carpathians. Hu, Mo, Ro, Sk, Uk.

**3472. *Ambrosia artemisiifolia* L., *A. elatior* L.** — Annual, stems erect, 20-100 cm, shortly ramified above, 4-angular, adpressed hirsute or glabrous. **Fruits achenes, covered up to bracteoles, obovoid, spherical or slight ellipsoid, apex with beak, calyx with 5-7 teeth, 3.5-4 x 1.9-2.3 mm. Surface glabrous, lustreless, mostly pale-brown. 2n = 36.** Native to North America, recently often hauling into waste grounds, railway embankments, dumps and depots. Hu, Mo, Ro, Sk, Uk.

**3473. *Ambrosia psilostachya* DC., *A. coronopifolia* Torr. et Grey** — Perennial, up to 30-80 cm high, stems adpressed pubescent. **Fruits achenes, apex narrowed into beak, lower part covered up to bracteoles, 3.3-3.7 x 2.6-3 mm. Surface with distinct venation, covered with long greenish hairs, dull, yellowish-to dark-brown. 2n = 72, 108.** Originally growing in North America; occasionally hauling to European dry, sand-stony waste grounds, railways and depots. Ro.



**3474. *Ambrosia trifida* L., *A. integrifolia* Muhl** — Annual, up to 50-200 cm high, stems erect, hirsute, glabrous below. **Fruits achenes, covered up to bracteoles, obovoid, apex narrowed into beak, 5.5-6.5 x 4.2-4.8 mm. Surface glabrous, smooth, scarce warty, lustreless, of sandy colour or greyish. 2n = 24.** Native to North America, cultivated grounds and waste places; occasionally hauling into the Carpathians and naturalized there. Ro, Uk.

**3475. *Xanthium albinum* (Widder) H. Scholz, *X. saccharatum* auct. non Wallr.** — Annual, aromatic, yellowish-green, stem erect, 10-80 cm high, much ramified. **Fruits achenes, ellipsoid with two crooked thorns on apex, 5-6 mm long, 15-25 x 8-12 mm. Surface covered with numerous 1-3 mm long spines, crooked at ends, lustreless, purplish-brown. 2n = 36.** Native to Europe, river and brookbanks, railway stations and waste places. Sk, Uk.

**3476. *Xanthium albinum* subsp. *riparium* (Čelak.) Widder et Wagenitz, *X. riparium* Itzigs. et Hertsch** — Annual, stems 15-50 cm high, probably of hybrid origin. **Fruits achenes, ellipsoid with 2 bended horns at apex, 16-22 x 6-9 mm. Surface covered with numerous 1-3 mm long, bended on upper part on the achene subulate spines, lustreless, purplish-brown.** Native to central Europe, along roads, riverbanks, in moist sandy and weedy places. Pl, Ro, Uk.

**3477. *Xanthium italicum* Moretti, *X. californicum* Greene, *X. echinatum* Murray** — Annual, aromatic, up to 30-100 cm high, stems stout, cylindric, erect, ramified. **Fruits achenes, ellipsoid with two 5-6 mm long thorns at apex covered with 1-2 mm long spines, 22-28 x 13-17 mm. Surface covered with numerous 2-3 mm long, smooth or hairy at end crooked thorns, lustreless, purplish-brown. 2n = 36.** Originally growing in North America; long time ago hauling into Europe and naturalized there. Hu, Mo, Pl, Ro, Sk, Uk.

**3478. *Xanthium spinosum* L., *Acanthoxanthum spinosum* (L.) Fourr.** — Annual, up to 20-80 cm high, stem erect, branched from base, stripped green, pubescent. **Fruits achenes, ellipsoid, apex with one glabrous thorn, 11-14 x 7-8 mm. Surface greyish-downy with numerous, crooked at ends, purplish-brown spines. 2n = 36.** Originally growing in South America, hauling into Europe and naturalized in its warmer areas, waste grounds, rural areas, dumps and ways; throughout the Carpathians.

**3479. *Xanthium strumarium* L.** — Annual, stem erect, 15-100 cm high, much ramified, adpressed, shortly hirsute. **Fruits achenes, ellipsoid with two straight or hooked thorns at apex, 14-17 x 6-8 mm. Surface dense short-hairy, with numerous crooked at ends, purplish-brown spines. 2n = 36.** Native to Eurasia, waste grounds, rural areas, railway stations, dumps. Hu, Mo, Pl, Ro, Sk, Uk.

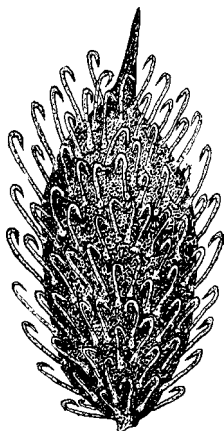
**3480. *Galinsoga parviflora* Cav., *G. quinqueradiata* Ruiz et Pav.** — Annual, stems 20-80 cm high, ramified, slender, glabrous. **Fruits achenes, slight prolonged obovoid, apex truncate with membranous crenulate scales, gradually narrowed toward base, 1.4-1.6 x 0.6-0.7 mm. Surface dull, short hairy, dark brownish-black, scales and hairs pinkish-arenaceous. 2n = 16.** Originally growing in South America; in the whole Carpathians naturalized as a common weed in gardens, fields, waste grounds, roadsides.

**3481. *Galinsoga urticifolia* (Humb. Bonpl. et Kunth) Benth, *G. ciliata* (Raf.) Blake** — Annual, up to 20-80 cm high, stems patent-hirsute below. **Fruits achenes, cuneiform, apex truncate, pappus with 12 or more membranous aristate scales, 1.5-1.7 x 0.5-0.7 mm. Surface dull, fine hairy, greyish-black, scales and hairs of arenaceous colour. 2n = 32.** Originally growing in South America; scarce or commonly naturalized as a weed in gardens, vineyards and among root crops. Hu, Mo, Ro, Sk, Uk.

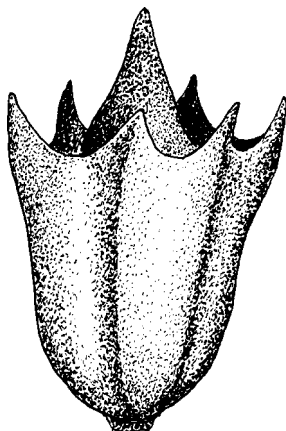
**3482. *Schkuhria isopappa* Benth., *S. advena* Thell.** — Annual, stems erect, 20-50 cm high. **Fruits achenes, cuneiform, 4-angular, slight compressed, apex truncate, pappus with 8 spotted and above crenate scales, gradually narrowed toward base, 4.5-5.1 x 0.9-1.1 mm. Surface longitudinal furrowed, dull, pale-brown and scarce blackish-spotted.** Originally growing in South America; rarely hauling into Europe, including the Carpathians, temporarily naturalized.

**3483. *Madia sativa* Molina** — Annual, up to 30-100 cm high, stems erect, glandularly sticky, aromatic. **Fruits achenes, cuneiform, prolonged ovoid or prismatic, 4-angular, lateral compressed, without pappus, 5.5-6.5 x 2-2.4 mm. Surface longitudinal fine striped and waved, dull, pale-greyish or brownish. 2n = 32.** Originally spread from South America; in the past experimentally cultivated as oil herb, at present hauling to and fro and temporarily naturalized.

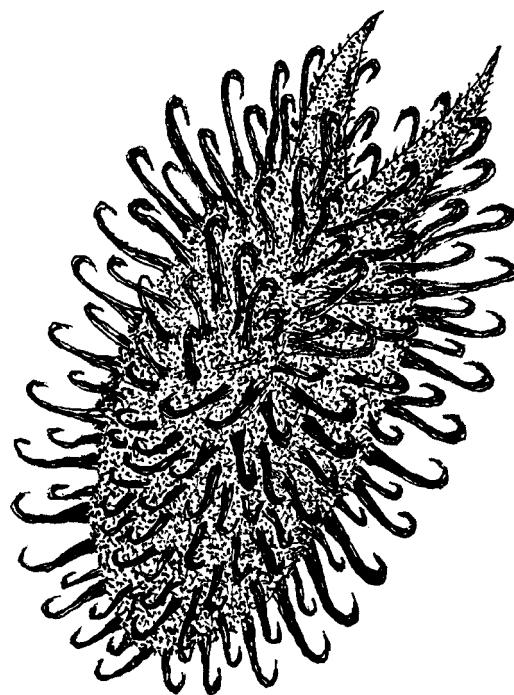




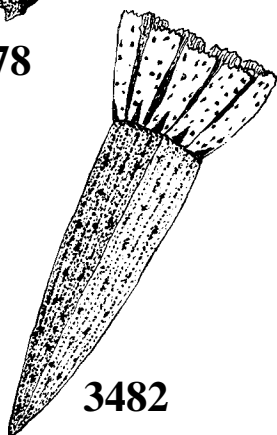
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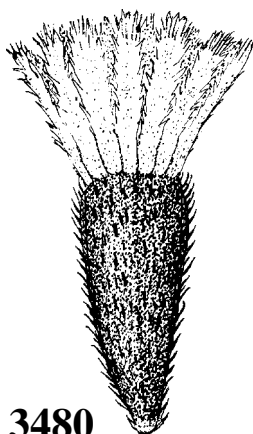
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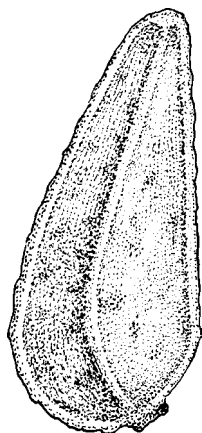
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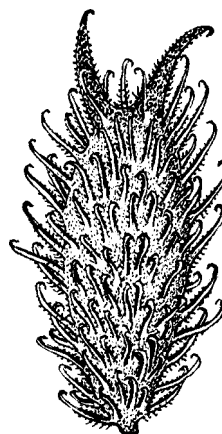
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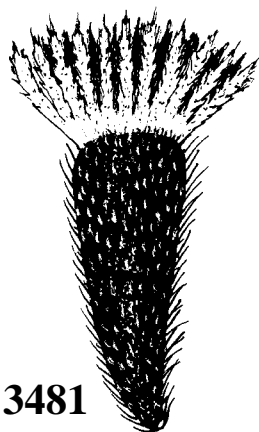
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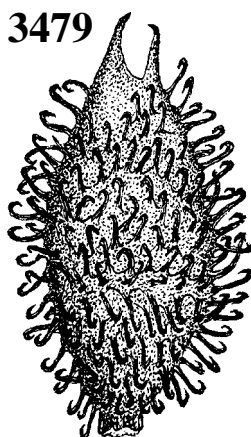
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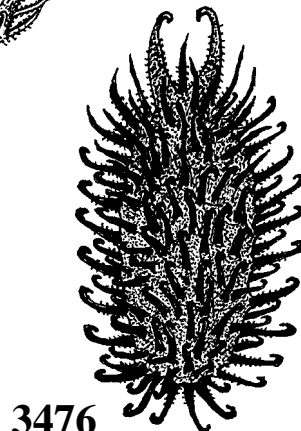
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**3484. *Gaillardia aristata*** Pursh. — Perennial, stems 50-100 cm high, of slightly irregular growth, easily procumbent, with big yellow flowers on reddish foundation. **Fruits achenes, obpyramidal, apex with crest from 4-9 prickles connate below, 3.8-4.2 x 2.8-3.2 mm. Surface dense covered with long yellowish or whitish hairs.** Native to the southern North America; in the Carpathians commonly cultivated in many cvs.

**3485. *Gaillardia x hybrida*** hort. — Annual, stems 20-40 cm high, with numerous yellow, reddish-hemmed flowers, rarely winterless. **Fruits achenes, obpyramidal, apex with crest from 4-6 prickles, 4.2-4.6 x 2.4-2.7 mm. Surface dense covered with long whitish or yellowish hairs.** In the Carpathians cultivated in gardens as a hybrid of unknown origin.

**3486. *Gaillardia pulchella*** Foug. — Annual, coarsty hirsute, stems erect, 20-50 cm high, ramified from base, hirsute. **Fruits achenes, obovoid, apex truncate, crest from 5 to 10 white and membranous spined scales, 2.8-3.2 x 1.3-1.5 mm (without crest). Surface greyish-brown, lustreless, covered with white membranous spines scales. 2n = 34, 68.** Native to North America; usually cultivated as an ornamental in gardens, occasionally naturalized.

**3487. *Tagetes erecta*** L., *T. major* Gaertn. — Annual, strongly aromatic, stems 50-80 cm (low forms 10-20 cm) high, stout, moderately ramified above. **Fruits achenes, narrow up to linear-shaped, 3 to 4-angular, compressed, with 3 to 6 free scales on apex, one or two of them like long spines, 8.5-9.5 x 1.1-1.3 mm. Surface tight fitting hirsute, slight lustrous, black. 2n = 24.** Originally growing in North America; usually cultivated as a summer ornamental plant in gardens; throughout the Carpathians.

**3488. *Tagetes patula*** L. — Annual, aromatic, glabrous, stems erect, 10-50 cm high, simple or patent-ramified, purplish. **Fruits achenes, linear-shaped, 3- or 4-angular, flattish, with 2-3 shorter and one longer scales on apex, 10-11 x 1-1.2 mm. Surface short hirsute, dull or slight lustrous, black, scales and hairs yellowish. 2n = 48.** Originally growing in North America; in the Carpathians very often cultivated for ornament in gardens, uniquely naturalized.

**3489. *Anthemis altissima*** L., *Cota altissima* (L.) Gay — Annual, robust, pubescent to nearly glabrous, stems 20-120 cm high, with subcorymbose branches,

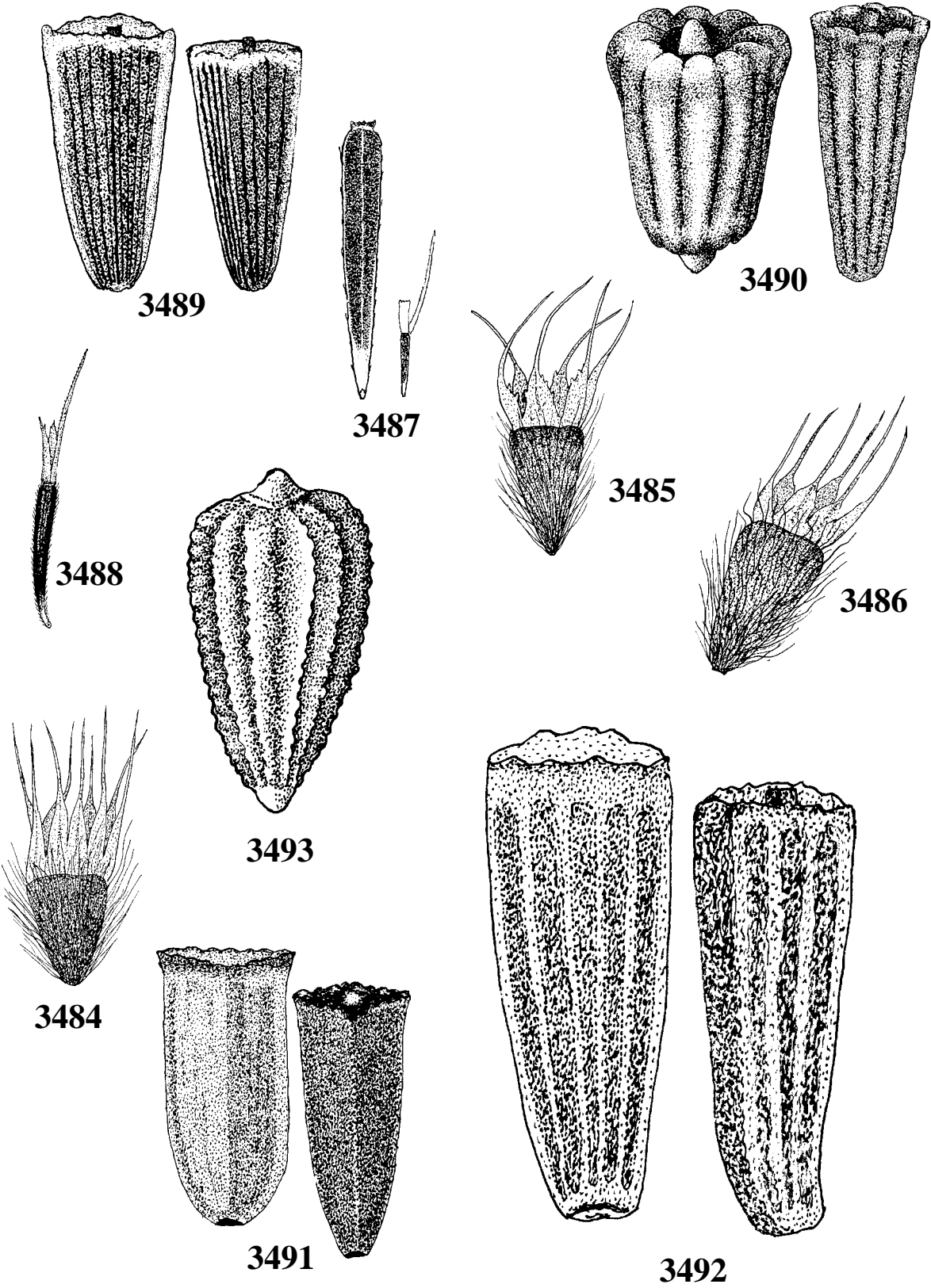
leaves ovate, 2- to 3- pinnatipartite. **Fruits achenes, obpyramidal-subcompressed, very narrow winged, 7-10 striate on each side, 2.8-3 x 1.4-1.6, resp. 2.5-2.7 x 1.1-1.3 mm. Surface smooth, dull, pale- to dark-brown. 2n = 18.** Native to southern Europe, in cultivated lands and waste places; frequent casual in the Carpathians.

**3490. *Anthemis arvensis*** L. — Annual to biennial, scarcely hirsute up to downy, stems erect, 10-50 cm, ramified from base. **Fruits achenes, obconical with 10 ribs in border or with 8 ribs in target fruits, both often bended with truncate apex, 1.8-2.2 x 1.3-1.4 or 2-2.4 x 0.8-1 mm. Surface glabrous, dull, pale yellowish-brown. 2n = 18.** Native to Europe, secondary cosmopolitan as weed of fields, fallows, boundaries, waste places and dry pastures. Hu, Mo, Pl, Ro, Sk, Uk.

**3491. *Anthemis austriaca*** Jacq., *Cota austriaca* (Jacq.) Schultz-Bip., *Cotula austriaca* (Jacq.) Gáyér — Annual to biennial, stems erect, much ramified, 10-60 cm high, scarcely pubescent. **Fruits achenes, triangular in border (left) or prismatic in target (right) fruits, both with narrowed base, truncate, crenate apex, flattish, 2.3-2.5 x 1-1.2 mm or 2.3-2.5 x 0.9-1.1 mm. Surface glabrous, dull, pale- or pinkish-brown. 2n = 18.** Native to Europe, as weed in fields, gardens, fallows, boundaries of warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**3492. *Anthemis carpatica*** Kit., *A. kitaibelii* DC., *A. montana* Sibth. et Sm. — Perennial, stems archly ascending, 5-30 cm high, flexible, sticky pubescent. **Fruits achenes, of two types: border ± cylindric (left), target ± prismatic (right), both with truncate apex and narrowed base, 2.1-2.3 x 0.8-0.9 or 1.7-2 x 0.7-0.8 mm. Surface glabrous, slight lustrous, arenaceous.** Native to the higher mountains of central and southern Europe, in rocky and non-grassy places. Ro, Uk.

**3493. *Anthemis cotula*** L., *A. foetida* Lam., *Maruta cotula* (L.) DC. — Annual, unpleasant smelling, tomentose or glabrous, stems erect, ramified, 20-60 cm high. **Fruits achenes, obovoid or cylindric, obconical, longitudinal furrowed, apex ± truncate, narrowed toward base, 1.4-1.8 x 0.7-0.9 mm. Surface of grooves waved or warty, slight lustrous, pale- to dark-brown. 2n = 18.** Native to European waste grounds, roadsides, fields, rubbish places. Hu, Mo, Pl, Ro, Sk, Uk.



**3494. *Anthemis cretica* L.** — Perennial, non-flowering shoots forming  $\pm$  dense cushions, stems usually simple, leafy up to about the middle. **Fruits achenes, obpyramidal to turbinate with acute rim at broad apex or with very short corona, bottom narrowed, 3.1-3.5 x 1.6-1.8 mm or 2.7-3.1 x 1-1.2 mm. Surface sometime slight channelled and furrowed, mainly on inner side, smooth or granulate, light-brown.** Native to the mountains of southern Europe. Ro.

**3495. *Anthemis montana* L., *A. orientalis* (L.) Degen subsp. *montana* (L.) Hayek** — Perennial, tufted, with numerous non-flowering shoots, stems archly ascending, 10-30 cm high, unbranched. **Fruits achenes, cylindric or slight prismatic, apex truncate, base narrowed, border achenes bigger than target, 2.3-2.7 x 1-1.2 mm, 2-2.4 x 0.6-0.7 mm. Surface longitudinal faint furrowed, glabrous, whitish or arenaceous. 2n = 18.** Native to European rocks and sandy pine forests. Hu, Mo, Pl, Ro, Sk, Uk.

**3496. *Anthemis ruthenica* M. Bieb., *A. neilreichii* Ortm.** — Annual, stems erect, up to 15-50 cm high, viscid and long-pubescent, much ramified below. **Fruits achenes, cylindric or slight obconic, longitudinal furrowed, apex truncate, narrowed toward base, 1.8-2.2 x 1-1.2 mm. Surface glabrous, dull or slight lustrous, arenaceous or pale-brown. 2n = 18.** Native to Eurasian sunny, stony slopes, boundaries, embankments and sandbanks. Hu, Mo, Pl, Ro, Sk, Uk.

**3497. *Anthemis subtinctoria* Dobrocz.** — Perennial, stems 30-70 cm high, scarcely pubescent, branched from the base or in the upper half, equally leafy, flowers light-yellow. **Fruits achenes, cylindric or obconic, lateral flattish, apex truncate, narrowed toward the base, 2.2-2.6 x 0.9-1.1 mm (border achenes) or 1.7-2 x 0.6-0.7 mm (target achenes). Surface longitudinal furrowed, glabrous, pale-brown.** Native to eastern Europe, in sunny drying up stands, on rocky and steppe slopes, rarely as a weed in fields. Mo, Uk.

**3498. *Anthemis tinctoria* L., *Cota tinctoria* (L.) J. Gay.** — Perennial, stems and leaves scarcely hirsute to lanate, stems erect, 40-60 cm high, simple or little branched. **Fruits achenes, prismatic, 4-angular, apex truncate and crenate, 1.8-2.2 x 0.7-0.9 mm. Surface longitudinal furrowed, glabrous, slight lustrous, pale purplish-brown. 2n = 18.** Native to Eurasia, sunny, scrubby slopes, rocky and steppe grounds, secondary at boundaries and embankments. Hu, Mo, Pl, Ro.

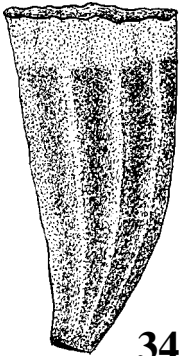
**3499. *Anthemis triumfetti* (All.) DC., *Chamaemelum triumfetti* All.** — Perennial, up to 30-80 cm high, erect, ramified above, greyish, pubescent. **Fruits achenes, prismatic, 4-angular, slight compressed, apex truncate, base narrowed, 2.1-2.3 x 0.8-0.9 mm (border achenes) or 2.1-2.3 x 0.6-0.7 mm (target achenes). Surface glabrous, slight lustrous, purplish-brown.** Native to southern Europe, Asia Minor and Caucasus, rocky slopes, railway embankments of arid areas; rare in the Carpathians. Ro.

**3500. *Santolina chamaecyparissus* L.** — Semishrub, evergreen, tufted, aromatic, 10-50 cm high, with numerous leafy and lanate, erect or ascending flowering stems, densely branched. **Fruits achenes, prolonged obovoid or cuneiform, 3-4-angular, apex without crest, gradually narrowed toward base, 2-2.3 x 0.7-0.8 mm. Surface fine longitudinal striate, dull or faint lustrous, silverish-grey.** Native to the southern Mediterranean; rarely cultivated for ornament in gardens and rock-gardens. Uk.

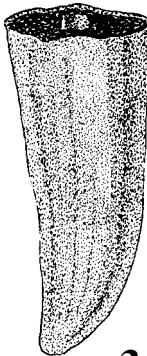
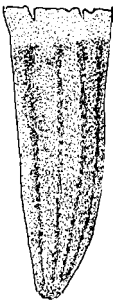
**3501. *Santolina rosmarinifolia* L., *S. viridis* Willd.** — Shrub, stems 15-60 cm high, erect or ascending from a procumbent branched twigs. **Fruits achenes, cuneiform, 4-angular, apex truncate, bottom narrowed, border achenes winged, broader, 1.8-2.1 x 1-1.2 mm; target achenes unwinged, thinner, 1.9-2.3 x 0.6-0.8 mm. Surface smooth, lustrous, silverish-grey. 2n = 18, 36.** Native to the Iberian Peninsula; in the Carpathians rarely cultivated as an aromatic plant in gardens.

**3502. *Achillea ageratum* L.** — Perennial, stem single, stout, glabrous, shortly pubescent, 30-70 cm high, simple or ramified. **Fruits achenes, prolonged obovoid, border achenes broader, target narrower, flattish, margin with cartilaginous hem, 1.3-1.5 x 0.6-0.7 mm (border achenes), 1.1-1.3 x 0.5-0.6 mm (target achenes). Surface glabrous, lustreless, whitish-grey. 2n = 18.** Native to the eastern Mediterranean region; in the Carpathians cultivated to and fro for camphor oil, locally naturalized. Ro.

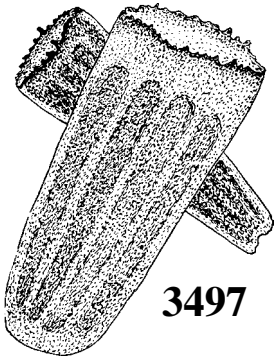
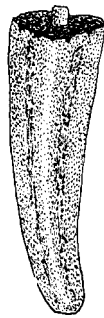
**3503. *Achillea asplenifolia* Vent.** — Perennial, up to 30-90 cm high, stem erect, with 4-10 stem articles, glabrous or dispersed pubescent. **Fruits achenes, cylindric, compressed, apex and base rounded, 1.6-1.8 x 0.6-0.7 mm. Surface glabrous, lustreless, whitish-grey. 2n = 18.** Native to central Europe, wet meadows, boundaries, riverbanks, mainly in saline grounds. Hu, Ro, Sk.



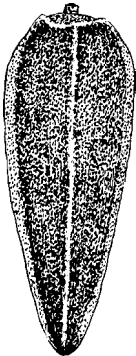
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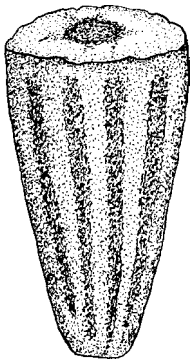
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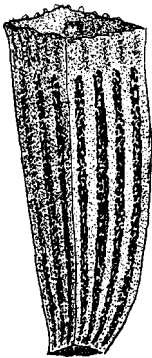
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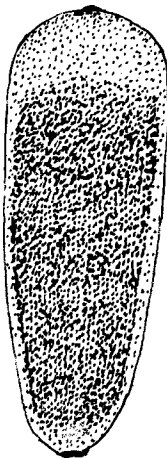
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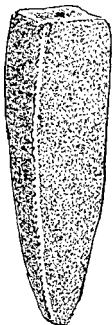
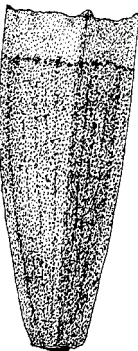
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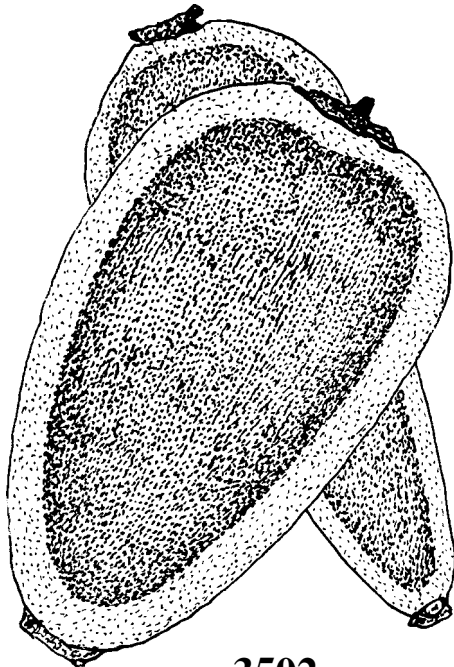
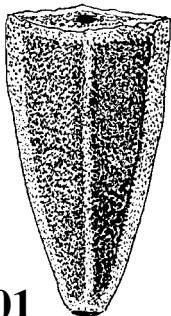
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**3504. *Achillea cartilaginea*** Ledeb. — Perennial, stems stout, up to 45-120 m high, ramified above, pubescent. **Fruits achenes, cuneiform, compressed with cartilaginous hem, apex slight rounded, narrowed toward base, 1.8-2.1 x 0.9-1 mm. Surface slight lustrous, glabrous, whitish-grey. 2n = 18.** Native to eastern Euro-Siberia, rare in scrubs, moist and wet places. Mo, Pl, Ro, Uk.

**3505. *Achillea clavennae*** L., *Ptarmica clavennae* (L.) DC. — Perennial, greyish, tomentose or glabrous, stems erect, 15-40 cm high, simple, leafy above. **Fruits achenes, prolonged obovoid or slight cuneiform, compressed, apex truncate, base slight narrowed into hilum with cartilaginous hem, 2.5-2.9 x 1.1-1.3 mm. Surface glabrous, longitudinal dense striate, lustrous, silverish. 2n = 18.** Native to the Alps and Balkan Peninsula, montane rocky and grassless places. Ro.

**3506. *Achillea clusiana*** Tausch, *Ptarmica clusiana* Schur — Perennial, stems subtle, ascending, up to 20 cm high, finely striate, pubescent. **Fruits achenes, cuneiform, flattish, apex truncate, to base gradually narrowed with cartilaginous hem, 2-2.2 x 0.7-0.8 mm. Surface glabrous, slight lustrous, whitish-grey. 2n = 18.** Native to the East Alps, montane rocky places. Ro.

**3507. *Achillea clypeolata*** Sibth. et Sm. — Perennial, up to 15-45 cm high, erect, striate, unbranched or rarely branched, tomentose. **Fruits achenes, cuneiform or obovoid, flattish with cartilaginous whitish hem, apex truncate, gradually narrowed toward base, 1.4-1.6 x 0.6-0.7 mm. Surface glabrous, dark-brown or grey, hem whitish.** Native to the Balkan Peninsula, grassless uplands. Ro.

**3508. *Achillea coarctata*** Poir., *A. compacta* Willd. — Perennial, tomentose, stems erect, striate, leafy, 20-60 cm high, simple, rarely ramified above. **Fruits achenes, prolonged obovoid or slight cuneiform, compressed with whitish hem, 1-1.2 x 0.4-0.6 mm. Surface glabrous, dull or slight lustrous, greyish-brown. 2n = 18.** Native to the Balkan Peninsula and Asia Minor, sunny places, arid uplands and rocks. Mo, Ro, Uk.

**3509. *Achillea collina*** J. Becker ex Rchb., *A. millefolium* L. subsp. *collina* (J. Becker) Weiss — Perennial, sericeous, stem 30-80 cm high, erect, ramified from half. **Fruits achenes, prolonged ovoid**

**or slight cuneiform, compressed, apex truncate, narrowed toward base with whitish cartilaginous hem, 1.7-1.9 x 0.7-0.8 mm (border achenes), 1.7-1.9 x 0.5-0.6 mm (target achenes). Surface glabrous, slight lustrous, whitish-grey. 2n = 36.** Native to European steppe slopes, stony forest steppes on weakly saline grounds. Hu, Mo, Ro, Sk, Uk.

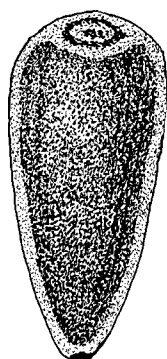
**3510. *Achillea crithmifolia*** Waldst. et Kit., *A. nobilis* Baumg. — Perennial, stems erect or ascending, 20-60 cm high, simple or floccosely ramified only above. **Fruits achenes, obovoid or cuneiform, compressed with whitish hem, apex truncate, base gradually narrowed, 0.8-1 x c. 0.5 mm. Surface glabrous, slight lustrous, dark-brown. 2n = 18, 36.** Native to southern Europe, rocky and stony slopes of mountains. Hu, Ro, Sk.

**3511. *Achillea depressa*** Janka — Perennial, stems 5-25 cm high, archly ascending, simple branched. **Fruits achenes, cylindric, compressed, apex truncate, base round, cartilaginous with whitish hem, 1.9-2.1 x 0.6-0.7 mm. Surface glabrous, lustreless, whitish-grey.** Native to the Balkan Peninsula, rocky places, loess uplands and sandbanks. Ro.

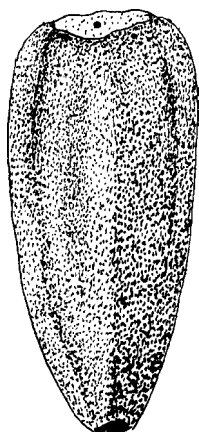
**3512. *Achillea distans*** Waldst. et Kit. ex Willd., *A. dentifera* DC. — Perennial, stout, stems erect, 10-150 cm high, simple or tufted, ramified above, scarcely lanate. **Fruits achenes, cylindric, lateral compressed with whitish, narrow hem, apex truncate, base round, with round hilum. 1.8-2 x 0.6-0.7 mm. Surface glabrous, slight lustrous, whitish-grey. 2n = 18.** Native to European mountains, light woods and their margins, rocky places of the alpine zone. Hu, Ro, Sk, Uk.

**3513. *Achillea filipendulina*** Lam. — Perennial, stems 100-150 cm high, scarcely leafy, caespitose. **Fruits achenes, cylindric, lateral compressed, apex truncate and bended down, with beak, 1.8-2 x 0.55-0.65 mm. Surface slight longitudinal furrowed, grey, margin whitish.** Native to the Caucasus; in the Carpathians cultivated in natural parks, sometimes for flower cutting in gardens.

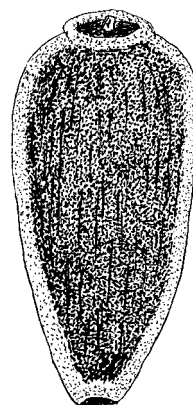
**3514. *Achillea grandifolia*** Friv. — Perennial, up to 30-100 cm high, stems erect, branched above. **Fruits achenes, cylindric or slight cuneiform, compressed, apex mostly truncate, bended down, 1.6-1.9 x 0.6-0.8 mm. Surface glabrous, slight lustrous, whitish-grey. 2n = 18.** Native to southeastern Europe,



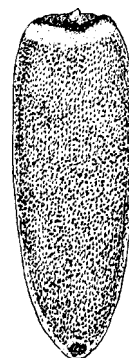
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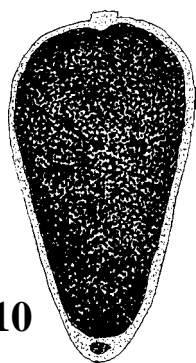
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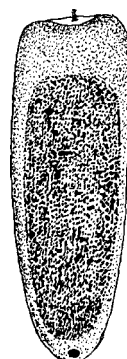
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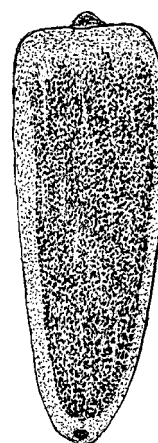
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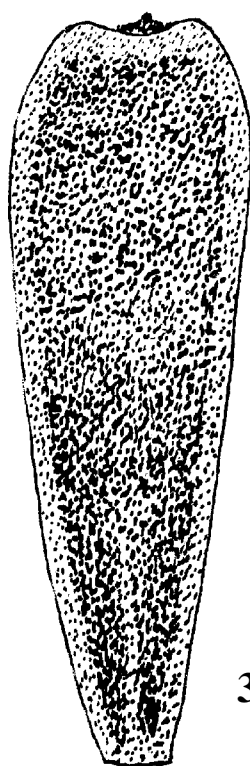
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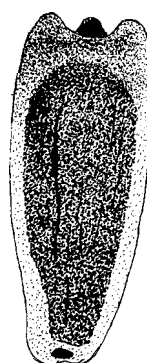
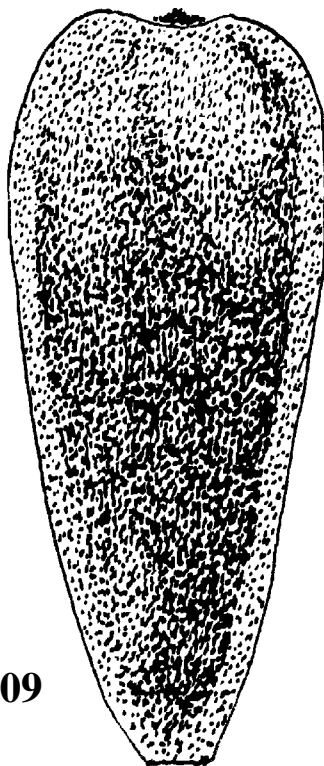
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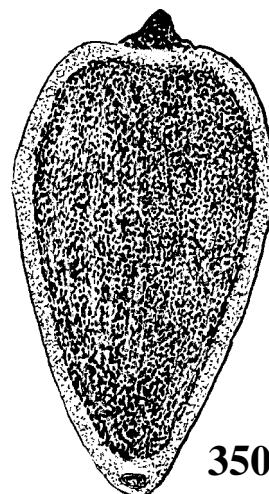
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in the past cultivated as a medicinal plant; in the Carpathians naturalized in some places.

**3515. *Achillea impatiens* L., *Ptarmica impatiens* DC., *P. spinosa* Schur** — Perennial, stems 45-100 cm high, erect, branched and puberulent above, glaucous below. **Fruits achenes, cylindric, lateral flattish, planoconvex, apex truncate or concave, 1.5-1.7 x 0.6-0.7 mm. Surface faint longitudinal striate, dull, grey, margin whitish.** Native to Siberia, in damp grasslands. Ro.

**3516. *Achillea leptophylla* M. Bieb.** — Perennial, pubescent to lanate, somewhat caespitose, stems up to 25 cm high, simple or branched from the woody stock, erect or ascending. **Fruits achenes, oblong, obovoid, lateral strong compressed, planoconvex, 2.3-2.7 x 0.9-1.1 mm. Surface lustreless, longitudinal faint striate, grey, margin whitish.** Native to southeastern Europe, in dry and sunny places, upland slopes. Ro, Uk.

**3517. *Achillea ligulata* Waldst. et Kit., *Ptarmica lingulata* Schur** — Perennial, stems erect, simple, 15-50 cm high, densely foliate, finely hirsute to glabrous. **Fruits achenes, compressed obconical, truncate above, bottom slight narrowed, 2.5-2.8 x 0.9-1.1 mm. Surface longitudinal striate, slight lustrous, with brim around, yellowish-brown.** Native to the Carpathians and the Balkan mountains, stony pastures, rocky slopes in subalpine and alpine zones. Pl, Ro, Uk.

**3518. *Achillea macrophylla* L., *Tanacetum macrophyllum* Schultz-Bip.** — Perennial, up to 40-75 cm high, stems erect, simple, tufted, ramified only above. **Fruits achenes, slight cuneiform, compressed, apex truncate, often with rest of the style, base narrowed with hilum, margin with whitish-hem, 2.4-2.7 x 0.8-1 mm. Surface wavy, glabrous, lustrous, whitish-grey.** Native to southeastern Europe, dry, sunny, stony and shrubby slopes; sometimes dragging into the Carpathians and naturalized there. Sk.

**3519. *Achillea micrantha* Willd.** — Perennial, 20-50 cm high,  $\pm$  tomentose, simple or branched, erect, leaves pinnatisect, lanceolate or linear. **Fruits achenes, oblong-obovoid, lateral flattish, planoconvex, longitudinal ribbed on ventral side, apex  $\pm$  roundish or truncate, bottom narrowed into the hilum, narrow winged, 1.3-1.6 x 0.5-0.6 mm. Surface dense appressed hairy, dull,**

**greyish-brown. 2n = 18, 36.** Native to southeastern Europe, on dry hillsides, sandy soils, riverbanks. Uk.

**3520. *Achillea millefolium* L.** — Perennial, up to 30-80 cm high, stems ascending or erect, tufty, ramified above, densely leafy. **Fruits achenes, prolonged, cuneiform, compressed, apex truncate, base narrowed, margin with whitish-hem, 1.8-2 x 0.6-0.7 mm. Surface glabrous, smooth, slight lustrous, whitish-grey. 2n = 54.** Native to Euro-Siberia, meadows, pastures, boundaries, forest margins and waste places. Sometimes cultivated in gardens, but only in pink or red forms. Br, Hu, Mo, Pl, Ro, Sk, Uk.

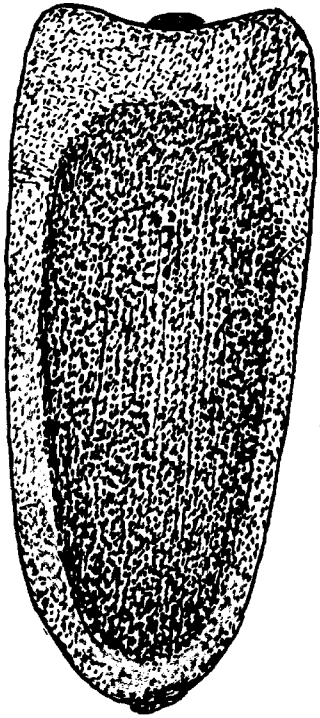
**3521. *Achillea neilreichii* A. J. Kern.** — Biennial to perennial, up to 20-60 cm high, stems erect, striate, pubescent, leafy. **Fruits achenes, cylindric, compressed, apex slight rounded, margin with whitish hem, 1-1.2 x 0.3-0.4 mm. Surface glabrous, slight lustrous, grey. 2n = 45.** Native to Europe, common on karst and rocky, grassless steppes of warmer areas. Mo, Ro, Sk, Uk.

**3522. *Achillea nobilis* L.** — Perennial, up to 15-60 cm high, stems erect, ramified only in inflorescence, tongues of the border flowers white, densely tomentose, with long adjacent hairs. **Fruits achenes, slight cylindric or cuneiform, compressed, apex  $\pm$  truncate with rest of the style or without it, base rounded margin with whitish-hem,, 1.9-2.2 x 0.6-0.7 mm. Surface glabrous, slight lustrous, whitish-grey. 2n = 18.** Native to Eurasia, rocky and karst steppes. Hu, Mo, Pl, Ro, Sk, Uk.

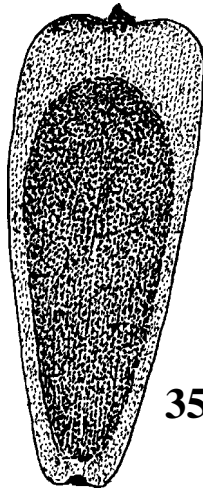
**3523. *Achillea ochroleuca* Ehrh., *A. pectinata* Willd. non Lam., *A. kitaibeliana* Soó** — Perennial, up to 20-40 cm, tomentose, stems erect, unbranched. **Fruits achenes, cuneiform, compressed, apex truncate, gradually narrowed toward base, margin with whitish cartilaginous hem, 1.8-2 x 0.5-0.6 mm. Surface glabrous, lustreless, whitish-grey. 2n = 18.** Native to Eurasia, sandy and stony steppes. Hu, Mo, Ro, Sk, Uk.

**3524. *Achillea oxyloba* (DC.) Schultz-Bip.** — Perennial, subglabrous to pubescent, stems up to 20 cm high, ascending, leaves oblong elliptical, basal petiolate, cauline, sessile. **Fruits achenes, oblong-obovate, biconvex, apex and bottom truncate, broad marginate, 2.5-2.8 x 0.9-1.1 mm. Surface undulated, longitudinal shallow striate, glossy, silverish.** Native to the Alps, the Apennines and the

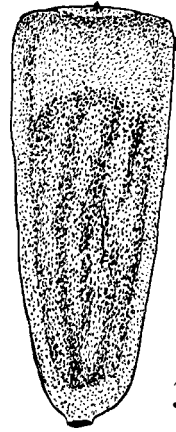




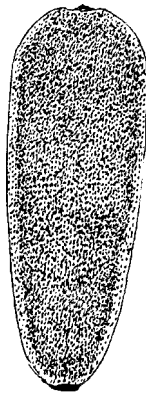
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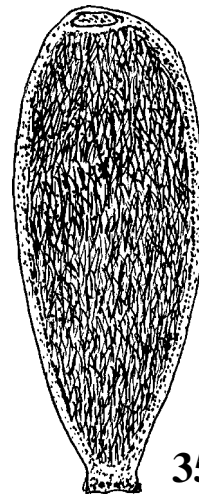
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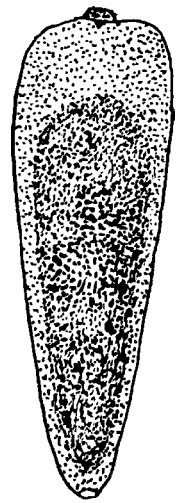
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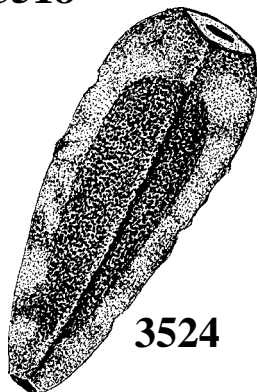
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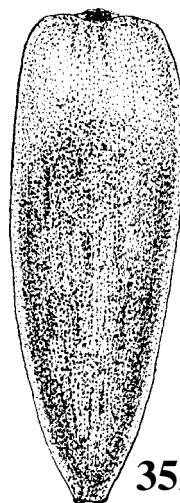
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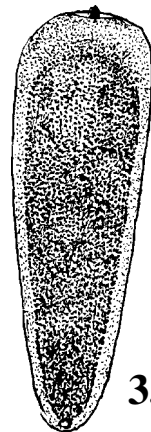
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eastern and southern Carpathians, on mountain rocks, in pastures and screes. Ro, Uk.

**3525. *Achillea pannonica*** Scheele, *A. millefolium* subsp. *pannonica* (Scheele) Oborny — Perennial, sericeous, stem 25-70 cm,  $\pm$  unbranched, stout. **Fruits achenes, cuneiform, compressed, apex truncate or bended down, gradually narrowed toward base, margin with whitish hem, 2.2-2.5 x 0.6-0.8 mm. 2n = 72.** Native to Europe, sunny stony slopes, wood steppes, rocks and sandbanks, uncultivated grounds. Hu, Mo, Ro, Sk, Uk.

**3526. *Achillea ptarmica*** L., *Ptarmica vulgaris* DC. — Perennial, up to 20-110 cm high, stems erect, simple or broomy branched above, pubescent only above. **Fruits achenes, cuneiform, flattish, apex truncate or bended down, gradually narrowed toward base, margin with whitish hem, 2.1-2.4 x 1-1.1 mm. 2n = 18.** Native to Eurasia, moist to wet meadows, eutrophic neutral reed swamps; cultivated mainly in full-blossom forms in gardens. Hu, Mo, Pl, Ro, Sk, Uk.

**3527. *Achillea roseo-alba*** Ehrend. — Perennial, stems erect, simple or branched, 15-100 cm high, with 5-15 internodes, flowers pink or white. **Fruits achenes, lateral compressed, obconic, apex and bottom truncate, 1.7-1.9 x 0.55-0.65 mm. Surface longitudinal fine striate, slight lustrous, dark-brown, cover whitish. 2n = 18, 36.** Native to southern and central Europe, waste places and disturbed grounds. Ro.

**3528. *Achillea schurii*** Schultz-Bip., *A. atrata* Baumg. — Perennial, stems single, seldom 2-4 in turf, erect, up to 10-30 cm high, finely hirsute, rarely ramify. **Fruits achenes, cuneiform, flattish, apex truncate, gradually narrowed toward base, margin with whitish-silver hem, 2.4-2.7 x 1-1.2 mm. Surface strong waved, glossy, silverish.** Native to the East Carpathians, rocky and grassless places, along brooks, in the alpine zone. Pl, Ro, Uk.

**3529. *Achillea setacea*** Waldst. et Kit., *A. millefolium* subsp. *setacea* (Waldst. et Kit.) Čelak. — Perennial, stems erect, 15-50 cm high, appressed hairy, usually simple, rarely branched above. **Fruits achenes, cuneiform, lateral compressed, apex truncate, base narrowed and rounded, margin with whitish hem, 1.6-1.8 x 0.5-0.6 mm. Surface longitudinal striate, glabrous, lustrous, whitish-grey. 2n = 18.** Native to Eurasia, shrubby and stony slopes,

loess hills, in clay and sandy soils. Hu, Mo, Pl, Ro, Sk, Uk.

**3530. *Achillea stricta*** Schleich. ex Gremli, *A. tanacetifolia* All. var. *stricta* Koch — Perennial, stems erect, 20-90 cm high, simple or tufted ramified above. **Fruits achenes, cylindric, compressed, apex truncate, slight gradually narrowed toward base, base rounded, margin with whitish hem, 2.2-2.5 x 0.7-0.9 mm. Surface longitudinal faint striate, lustrous, whitish-grey. 2n = 54.** Native to the Alps and Carpathians, light deciduous woods and shrubberies on calcareous grounds. Hu, Ro, Uk.

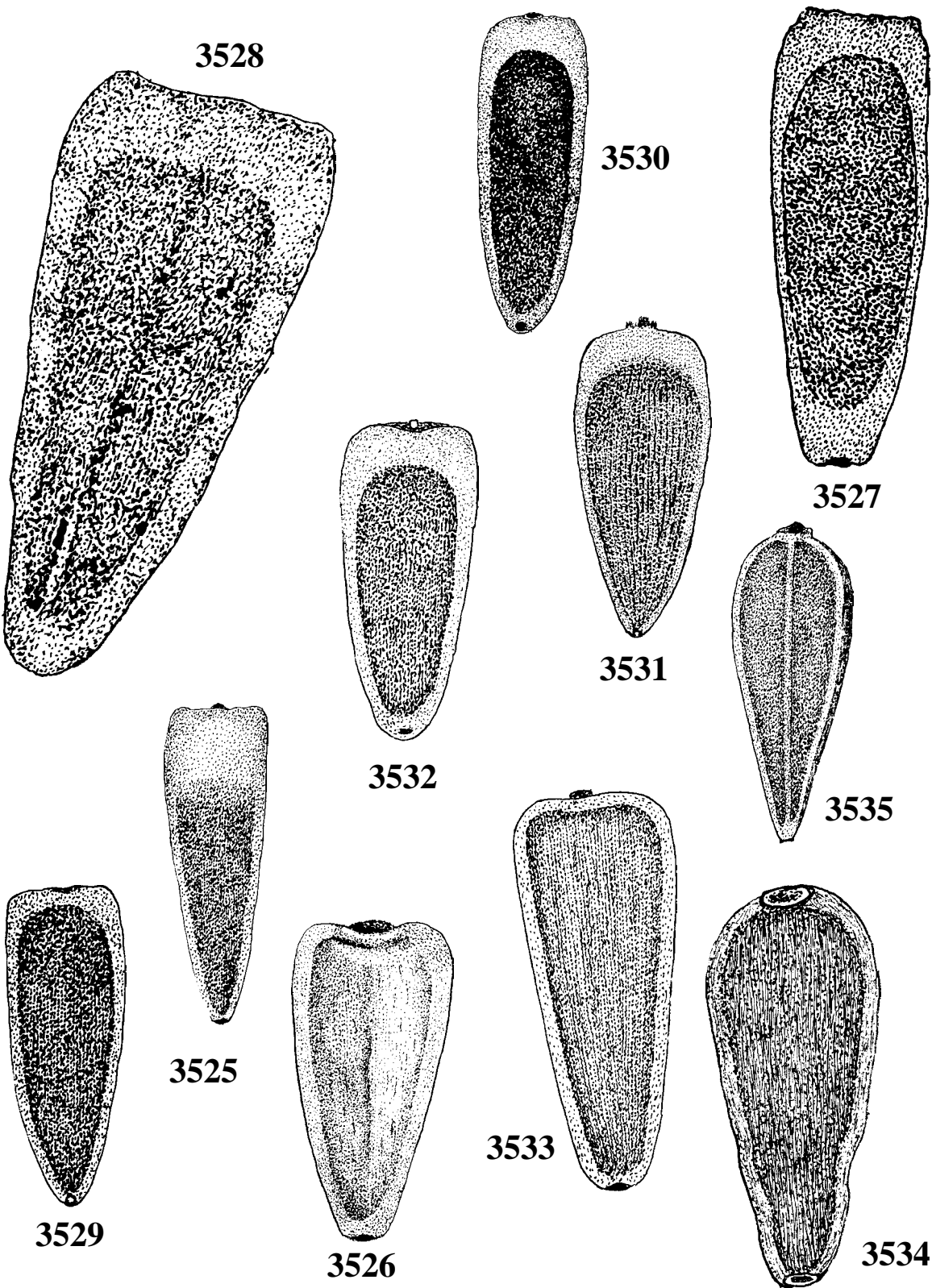
**3531. *Achillea sudetica*** Opiz, *A. millefolium* subsp. *sudetica* (Opiz) Oborny — Perennial, stems erect, up to 25-35 cm high, scarcely lanate, simple leafy. **Fruits achenes, cuneiform, compressed, apex truncate, with rest of the style, gradually narrowed toward base, margin with cartilaginous hem, 2.3-2.7 x 0.9-1.1 mm. 2n = 54.** Native to European mountain meadows and pastures, acid grounds. Sk.

**3532. *Achillea tanacetifolia*** All., *A. lanata* Grec. — Perennial, up to 20-110 cm high, lanate or glabrous, stems erect, branched only above. **Fruits achenes, slight cuneiform, compressed, apex truncate, base narrowed and round with cartilaginous hem, 2-2.2 x 0.7-0.8 mm. Surface longitudinal faint striate, lustrous, whitish-grey. 2n = 36.** Native to the Alps; in the Carpathians found in river valleys, forests and on rocks. Pl, Ro.

**3533. *Achillea tomentosa*** L. — Perennial, tomentose up to lanate, stems erect, 20-40 cm high, unbranched. **Fruits achenes, cuneiform, compressed, apex truncate, to base gradually narrowed, margin with cartilaginous hem, 1.7-2 x 0.7-0.8 mm. 2n = 18.** Native to south Europe, rarely cultivated in gardens and rock-gardens as permanent ornamental plant. Sk.

**3534. *Achillea umbellata*** Sibth. et Sm. — Perennial, subcaespitose, whitish-tomentose, stems up to 15 cm high, simple, erect. **Fruits achenes, oblong-obovoid, lateral compressed with hem around, 1.3-1.9 x 0.5-0.6 mm. Surface very fine longitudinal furrowed, lustrous, silverish, hem whitish. 2n = 18.** Native to Greece, mountain rocks; in the Carpathians rarely grown in rock-gardens.

**3535. *Chamaemelum nobile*** (L.) All., *Anthemis nobilis* L. — Perennial, pubescent, aromatic, stems ascending, 10-30 cm high. **Fruits achenes,**



cuneiform, dorsal side convex, ventral slight convex or flattish with three white ribs, apex  $\pm$  round, gradually narrowed towards base, 1.4-1.7 x 0.4-0.6 mm. Surface fine longitudinal striate, dull or slight lustrous, brown.  $2n = 18$ . Native to southwestern Europe; in the Carpathians currently cultivated in full-blossom cvs in gardens.

**3536. *Arctotis stoechadifolia*** Bergius — Perennial, white-tomentose, stems up to 100 cm high, decumbent, woody below, leaves obovate to linear oblong, entire to lyrate-pinnatifid, flowers yellow. **Fruits achenes, obovate, convexo-convex, apex truncate, with collar hem, bottom narrowed, 2.5-3 x 1.1-1.4 mm. Surface dense villous with white-brownish hairs, 2x as long as achene.** Native to South Africa, in the southern Carpathians cultivated for ornament, rarely naturalized in sandy waste places. Ro.

**3537. *Tripleurospermum perforatum*** (Mérat) M. Lainz, *Matricaria inodora* L. — Annual, stems up to 30-80 cm high, erect or ascending, floccosely ramified, young herb pubescent. **Fruits achenes, semi-cuneiform, apex truncate with semimembranous low corona, dorsal side with three ribs, ventral with two ribs, internal seeds 1.8-2.2 x 0.8-1 mm, external seeds 2.6-3 x 1.4-1.6 mm. Surface granular, blackish to black surface between the ribs, ribs pale-brown.  $2n = 36$ .** Native to Eurasia, rural areas, boundaries, as a weed of fields throughout the Carpathians.

**3538. *Tripleurospermum tchihatchevii*** (Boiss.) Hand.-Mazz. — Perennial, stems procumbent, ends ascending, densely leafy, 20-30 cm high. **Fruits achenes,  $\pm$  cylindric, apex as semimembranous tire, dorsal side with three protruded ribs, ventral side with two ribs, 2.9-3.3 x 1-1.2 mm. Surface blackish, granular between the ribs, ribs pale-brown.  $2n = 36$ .** Native to Asia Minor; in the Carpathians sometimes cultivated for ornament in rock-gardens.

**3539. *Matricaria discoidea*** DC., *M. suaveolens* (Pursh) Buch., *Chamomilla suaveolens* (Pursh) Rydb. — Annual, stems 5-40 cm high, ascending or erect, ramified from base. **Fruits achenes,  $\pm$  cylindric, dorsal side smooth, slight bended, shorter ventral side with three white ribs, apex truncate with low whitish corona, 1.1-1.5 x 0.3-0.5 mm. Surface glabrous, farinose, whitish-brown.  $2n = 18$ .** Native perhaps to Asia, a secondary cosmopolite,

rural spaces, roads, yards and waste places; in all Carpathian regions.

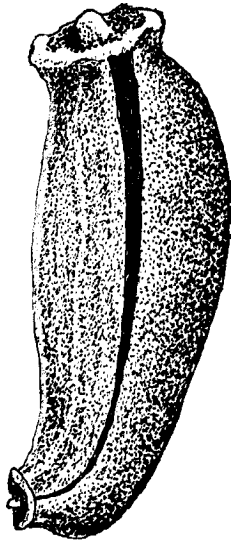
**3540. *Matricaria recutita*** (L.) Rauschert, *M. chamomilla* auct. non L., *Chamomilla recutita* (L.) Rauschert — Annual, glabrous, aromatic, stems erect or ascending, 10-60 cm high, ramified above, scarcely leafy. **Fruits achenes,  $\pm$  semiellipsoid, slight bended, longer dorsal side convex, smooth, shorter ventral side with 3 seldom 4 white ribs, apex truncate with white low corona, 0.8-1.2 x 0.4-0.6 mm. Surface fine granular, slight lustrous, greyish-brown.  $2n = 18$ .** Native to Euro-Siberia, fallows, rural areas, boundaries, fields. Hu, Mo, Pl, Ro, Sk, Uk.

**3541. *Matricaria trichophylla*** (Boiss.) Boiss., *M. tenuifolia* (Kit.) Sim, *Tripleurospermum tenuifolium* (Kit.) Freyn — Biennial, rarely perennial, stems 50-150 cm high, erect,  $\pm$  corymbosely branched above. **Fruits achenes,  $\pm$  obovoid, lateral compressed, dorsal side with 3 thick, stramineous ribs and 2 dark brown furrows, ventral side with 1 brown rib, 1.6-2 x 0.9-1.1 mm.** Native to south-eastern and east-central Europe, at hedges, roadsides and in cultivated fields. Hu, Ro.

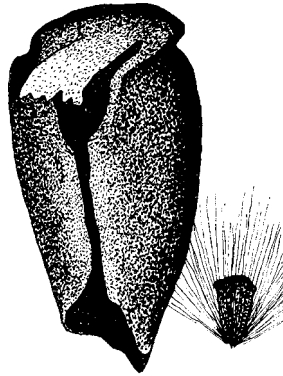
**3542. *Anacyclus clavatus*** (Desf.) Pers., *A. tomentosum* DC. — Annual, stems 15-50 cm high, branched, whole plant densely tomentose, greyish-green. **Fruits achenes, obconical, 4-angular, apex and bottom truncate, crest absent, 2.7-3 x 1.2-1.4 mm. Surface longitudinal furrowed and ribbed, lustreless, pale-brown.  $2n = 18$ .** Native to the Mediterranean as weed in fields and gardens. Uk.

**3543. *Anacyclus officinarum*** Hayne, *A. pulcher* Bess. — Annual, scarcely hairy, stems erect, simple or little branched, 15-30 cm high. **Fruits achenes, obpyramidal, 4-angular, lateral compressed, border with nontransparent wing, without wing inside, 2.9-3.3 x 1.2-1.4 mm. Surface longitudinal furrowed, lustreless, pale-brown.** Native to south-eastern Europe, fields, gardens, orchards of the southern Ukraine.

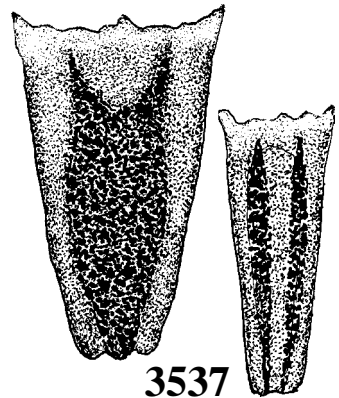
**3544. *Anacyclus radiatus*** Loisel. — Annual, up to 30 cm high, stems erect. **Fruits achenes, broadly (target) or prolonged (border) cuneiform or obovoid, strong compressed, apex truncate, crenate, base narrowed, 3.3-3.7 x 1.9-2.2 mm (target achenes) or 3.1-3.5 x 2.5-2.9 mm (border achenes). Surface faint longitudinal striate, dark-brown spotted, dull, arenaceous.** Originally



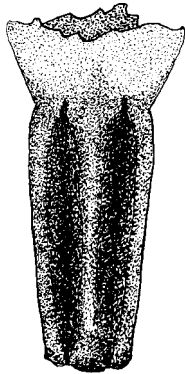
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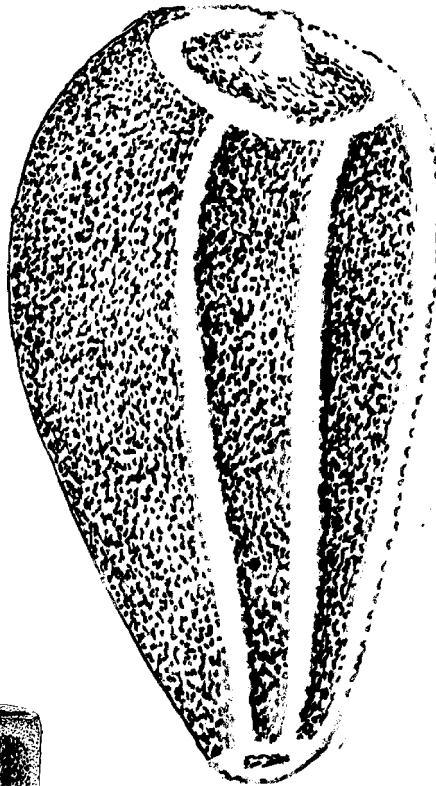
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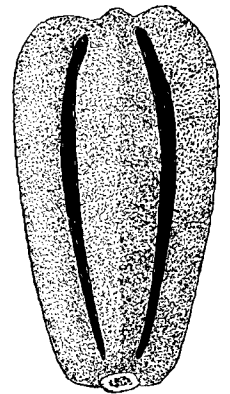
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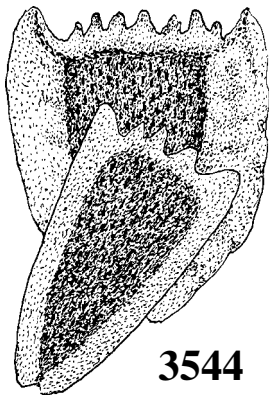
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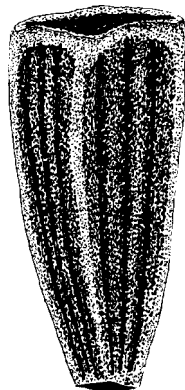
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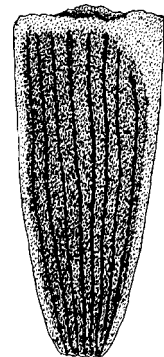
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growing in the Mediterranean region on sandy or stony grounds; in the Carpathians sometimes cultivated as ornamental summer plant in gardens.

**3545. *Chrysanthemum carinatum*** Schousb. — Annual, stems 40-80 cm high, with yellow ligules, reddish, whitish at base. **Fruits achenes, semi-cuneiform, lateral compressed, achenes of the ligulate and inner (tubular) florets lacerate at the apex, crest absent, 4-4.6 x 2-2.4 mm (target achenes) or 4-4.6 x 5-6 mm (border achenes). Surface smooth, ribbed, dull, greyish to pale-brown.** Native to northwestern Africa; in the Carpathians for ornament grown in gardens.

**3546. *Chrysanthemum coronarium*** L., *Pinardia coronaria* (L.) Less. — Annual, glabrous or scarcely hairy, stems erect, 20-70 cm high, ramified, much leafy. **Fruits achenes, cylindric, lateral compressed, apex truncate with broad lateral wing and long spine above (border achenes), target achenes with or without narrow wing, 3-3.5 x 2.9-3.3 mm (border achenes) or 3-3.5 x 1.5-1.7 mm (target achenes). Surface glabrous, dull, pale- or reddish-brown. 2n = 18.** Native to the Mediterranean, cultivated grounds and waste places; sometimes cultivated in gardens and uniquely naturalized. Hu, Mo, Ro, Sk, Uk.

**3547. *Chrysanthemum roseum*** Adam., *Ch. coccineum* Willd., *Pyrethrum roseum* M. Bieb. — Perennial, stems simple, rarely branched, 30-70 cm high. **Fruits achenes, oblong-obovoid, semi-cuneiform, 4-8 ribbed, with collar coronelets, narrowed toward base, 3.5-3.8 x 1.1-1.3 mm. Surface waved, longitudinal ribbed, fine granulate, lustreless, pale-brown.** Native to the Caucasus; in the Carpathians often grown for ornament in gardens.

**3548. *Chrysanthemum segetum*** L. — Annual, glabrous, stems erect, 20-60 cm high, forkly ramified, rarely simple. **Fruits achenes, cylindric, lateral compressed, with 10 ribs, border achenes with one or two lateral wings, 2.2-2.6 x 1.8-2.1 mm (border achenes), 2.2-2.6 x 1.1-1.3 mm (target achenes). Surface glabrous, dull, pale- or dark-brown. 2n = 18.** Native to the eastern Mediterranean, fields, boundaries and roads. Br, Mo, Pl, Ro, Sk, Uk.

**3549. *Dendrathera indicum*** (L.) Desmoulins, *Chrysanthemum indicum* L. — Perennial, semishrub,

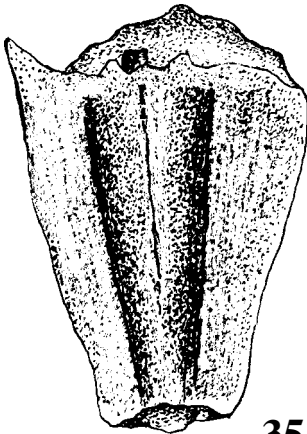
50-200 cm high, leaves aromatic, stems erect, dense, foliose, ramified. **Fruits achenes, prolonged obovoid, apex and base truncate, gradually narrowed from upper part up to base, 1.7-2 x 0.6-0.8 mm. Surface longitudinal furrowed, lustrous, dark-brown. 2n = 36, 54.** Native to south-eastern Asia; in the Carpathians commonly cultivated as a permanent ornamental plant in gardens.

**3550. *Dendrathera zawadskii*** (Herbrich) Tzvelev, *Chrysanthemum sibiricum* DC. — Perennial, stems ascending, 15-60 cm high, little ramified. **Fruits achenes, cuneiform, dorsal side convex with one or two ribs, ventral side ± flat with three whitish ribs, apex truncate with whitish low corona, 2.2-2.6 x 0.7-0.9 mm. Surface longitudinal faint striate, dull, brown. 2n = 54.** Native to Euro-Siberia, on calcareous rocks. Pl, Sk, Uk.

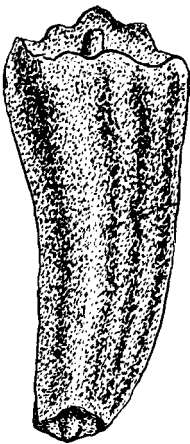
**3551. *Tanacetum millefolium*** (L.) Tzvel., *Chrysanthemum millefolium* (L.) E. I. Nyarády et L. Alex, *Pyrethrum millefoliatum* Willd. — Perennial, stems 10-50 cm high, flower head 6-10 mm in diam., up to 5 cm long on twigs. **Fruits achenes, prolonged obovoid or obpyramidal, with truncate apex and bottom, 3.3-3.6 x 0.8-1 mm. Surface longitudinal deep furrowed, tight fitting, dull, scarce hairy, pale-brown.** Native to the Balkan mountains and the Caucasus, steppes, steppe slopes, stony, calcite and chalky sites. Mo, Ro, Uk.

**3552. *Tanacetum vulgare*** L., *Chrysanthemum vulgare* (L.) Bernh. — Perennial, aromatic, stems 30-150 cm high, ramified above. **Fruits achenes, ± cuneiform, five-ribbed, apex truncate with low crenate corona, gradually narrowed toward base, border achenes longer and stronger, 1.5-2 x 0.6-0.9 mm. Surface longitudinal slight furrowed, whitish-grey. 2n = 18.** Native probably to southern Europe, light woods, cleared areas, coastal scrubs, stony slopes, roadsides and waste places throughout the Carpathians.

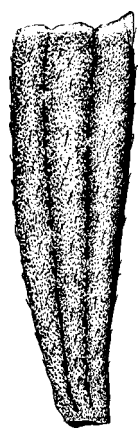
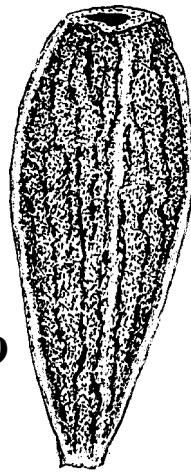
**3553. *Pyrethrum cinerariifolium*** Trev., *Tanacetum cinerariifolium* (Trev.) Schultz Bip. — Perennial, tufted, silvery-grey pubescent, stems erect, 15-45 cm high, simple or little branched. **Fruits achenes, cylindric or semicuneiform, with 5 to 7 ridges, apex with crenation, collar coronelet, base truncate, 3.5-4 x 1.2-1.4 mm. Surface glabrous, slight lustrous, glandular in furrows, pale-brown. 2n = 18.** Native to the eastern Mediterranean, seldom cultivated for its insecticidal properties. Hu, Ro, Uk.



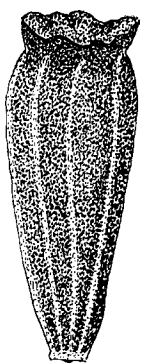
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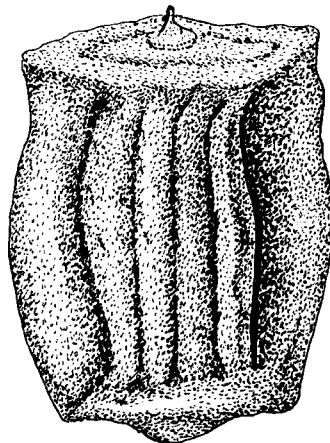
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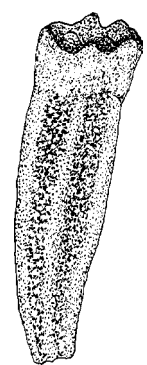
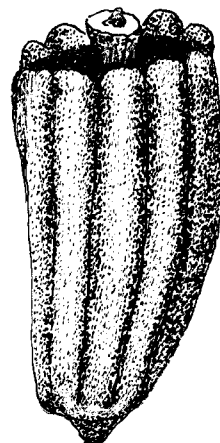
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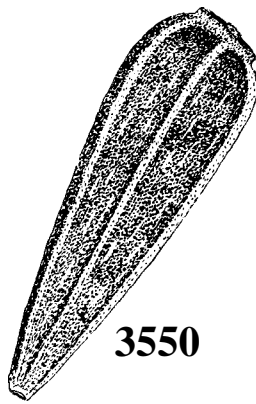
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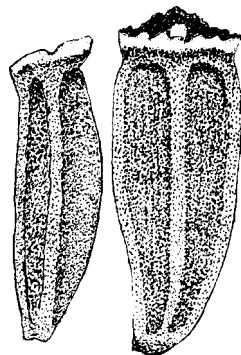
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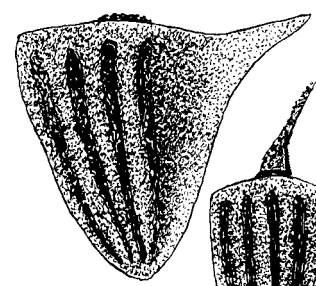
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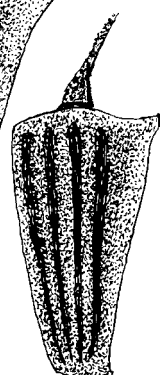
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**3554. *Pyrethrum clusii*** Fisch. ex Rchb., *Chrysanthemum subcorymbosum* Schur — Perennial, stems erect, ramified above. **Fruits achenes, ± cuneiform, apex with semimembranous collar, crenate, corona, gradually narrowed toward base, slight bended, 2.8-3.2 x 0.7-0.9 mm. 2n = 18.** Carpathian endemic, light woods and shrubberies, forest steppes of higher mountains. Sk, Uk.

**3555. *Pyrethrum corymbosum*** (L.) Scop., *Chrysanthemum corymbosum* L., *Tanacetum corymbosum* (L.) Sch.-Bip. — Perennial, stems 50-150 cm high, branched above, laxly caespitose. **Fruits achenes, semicuneiform, slight bended with 5-7 ribs, apex with collar, crenate corona, base narrowed, truncate, 2.9-3.4 x 0.7-0.9 mm. Surface fine longitudinal striate, dull, brown. 2n = 36.** Native to Eurasia, open woods, scrubs and meadows of all Carpathian regions.

**3556. *Pyrethrum macrophyllum*** (Waldst. et Kit.) Willd., *Chrysanthemum macrophyllum* Waldst. et Kit. — Perennial, up to 40-150 cm high, stems erect, unramified, striate, pubescent. **Fruits achenes, semicuneiform, with 5 longitudinal ridges, low, crenate collar, corolalet gradually narrowed toward base, bottom truncate, 1.9-2.3 x 0.6-0.8 mm. Surface waved with glossy excrescences, yellowish-white. 2n = 18.** Native to southeastern Europe; in the Carpathians often cultivated for ornament in gardens. Hu, Ro, Sk, Uk.

**3557. *Pyrethrum parthenium*** (L.) Sm., *Tanacetum parthenium* (L.) Schultz. Bip. — Perennial, strongly aromatic, stems erect, 30-100 cm, ramified above, glabrous, foliose. **Fruits achenes, semicuneiform, with 5-8 ridges, apex with short collar, whitish corona, gradually narrowed toward base, truncate, 1.4-1.7 x 0.4-0.6 mm. Surface glabrous, glossy in furrows, whitish to white. 2n = 18.** Native to southeastern Europe, since old times cultivated as ornamental and medicinal plant in gardens. Hu, Pl, Ro, Sk, Uk.

**3558. *Leucanthemella serotina*** (L.) Tzvelev, *Chrysanthemum serotinum* L. — Perennial, stems erect, 30-150 cm high, hairy, simple or little ramified above. **Fruits achenes, cuneiform, with 8 to 10 ridges, apex truncate, crenation with very low or without corolalet, gradually narrowed toward base, 2.5-3 x 1-1.2 mm. Surface furrows glandular, slight lustrous, yellowish-white or pale-brown. 2n = 18.** Native to Eurasia, wet shrubberies, meadows, reed swamps. Hu, Pl, Ro, Sk, Uk.

**3559. *Balsamita major*** Desf., *Chrysanthemum balsamita* (L.) Baill. — Perennial, stem 30-120 cm high, pubescent, much branched above. **Fruits achenes, cylindric or slight cuneiform, with 5-8 ridges, apex truncate, crenation with indistinct corolalet, narrowed toward base, 1.8-2.2 x 0.6-0.7 mm. Surface fine tuberculate, glabrous, ridges whitish, furrows pale-grey. 2n = 54.** Native to western Asia, in the past commonly cultivated as a medicinal plant in gardens, uniquely naturalized. Hu, Pl, Ro.

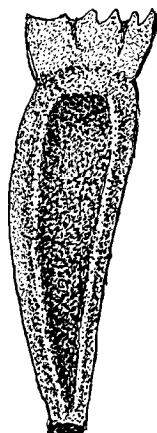
**3560. *Leucanthemopsis alpina*** (L.) Heywood, *Chrysanthemum alpinum* L. — Perennial, tufted, stems erect or ascending, 5-20 cm high, unbranched. **Fruits achenes, semicuneiform, apex truncate, crenation with collar corolalets, narrowed towards base, 2.8-3.3 x 0.9-1.1 mm. Surface longitudinal striate, glabrous, lustrous, yellowish-white. 2n = 18, 36, 54.** Native to the Carpathians, grassy and stony slopes, mountain meadows, snowdeck chairs, wet rocks and screes. Pl, Ro, Sk.

**3561. *Coleostephus myconis*** (L.) Rchb. fil., *Chrysanthemum myconis* L., *Myconia myconis* (L.) Briq. — Annual, stem erect, 10-45 cm high, branched, bare or scattered, hirsute, flowers yellow. **Fruits achenes, arching with spheroidal bottom part, furrowed central part and stout hilumous upper part, 3-3.9 x 0.9-1.1 mm. Surface with some darker furrows, lustreless, dirty-yellow. 2n = 18.** Native to the Mediterranean; in the Carpathians seldom cultivated as an ornamental in gardens.

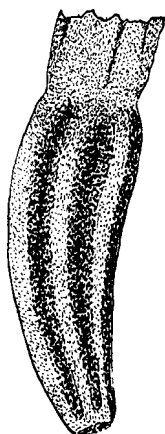
**3562. *Leucanthemum atratum*** (Ramond) DC., *Chrysanthemum atratum* Jacq. — Perennial, stems 15-30 cm high, arcuate, glabrous, unramified. **Fruits achenes, cuneate, apex with corolalet, longitudinal furrowed, 2.4-2.8 x 0.7-0.9 mm. Surface pinkish-white, furrows dark-brown.** Native to the mountains of Europe, rocky or sandy grounds of subalpine regions, rare. Ro.

**3563. *Leucanthemum ircutianum*** DC., *Chrysanthemum leucanthemum* var. *carpaticum* Rochel — Perennial, stems 30-80 cm high, branched, rhizome coarse, shortly creeping. **Fruits achenes, cuneate, narrowed toward base, 2.2-2.6 x 0.6-0.8 mm. Surface longitudinal furrowed with white spots, ribs dirty-white. 2n = 36.** Native to Eurasia, meadows, pastures, wood edges with moist and acid soils, rare. Pl, Sk.

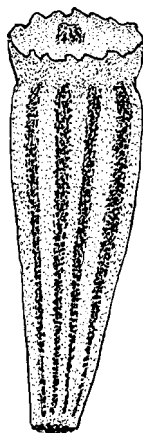




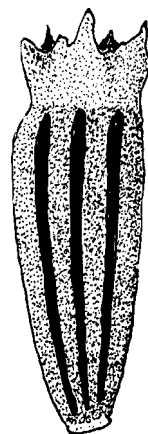
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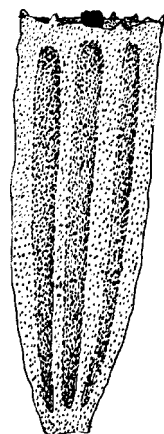
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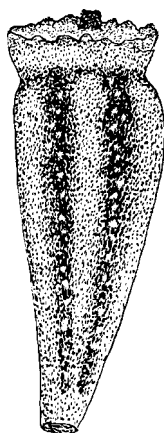
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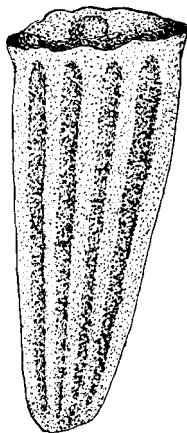
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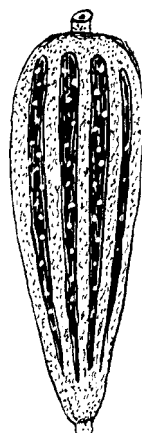
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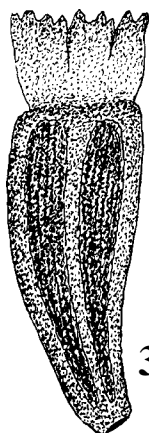
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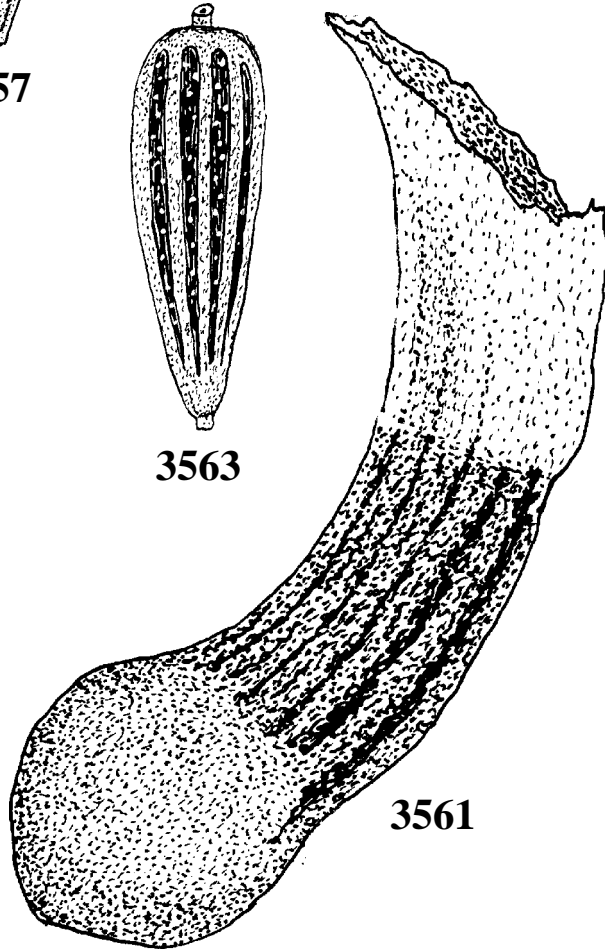
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**3564. *Leucanthemum margaritae*** (Gáyer) Zelený, *Chrysanthemum leucanthemum* var. *margaritae* Gáyer, *L. adustum* auct. non (W. D. J. Koch) Gremlí – Perennial, stems unramified, one-flowered, 50-80 cm high. **Fruits achenes, longitudinal ribbed, narrowed toward base, 2.7-3.1 x 0.8-1 mm. Surface whitish-yellow, furrows blackish with white spots. 2n = 54.** Native to Europe; only in the West Carpathians, usually in limestone mountains. Sk.

**3565. *Leucanthemum maximum*** (Ramond) DC., *Chrysanthemum leucanthemum* L. subsp. *maximum* (Ramond) Dostál p. p. – Perennial, robust, up to 1 m high, stems simple or poorly branched above. **Fruits achenes, longitudinal furrowed, narrowed at base, 2.5-3.8 x 0.9-1.1 mm. Surface with whitish ribs and blackish, white-dotted furrows. 2n = 54, 108.** An ornamental permanent plant of unknown origin, cultivated in gardens, uniquely escaping.

**3566. *Leucanthemum rotundifolium*** (Waldst. et Kit.) DC., *L. waldsteinii* Schultz-Bip., *Chrysanthemum rotundifolium* Waldst. et Kit. ex Willd. – Perennial, stems erect or ascendent, 20-70 cm, unramified, abundantly leafed, flower head single, rarely, in a number of 2-5, on long twig. **Fruits achenes, cuneate, longitudinal furrowed, 1.8-3.1 x 0.6-0.8 mm. Surface pinkish-white, furrows narrow and dark-brown. 2n = 18.** Carpathian endemic, mountain woods, dwarf pine areas, mountain meadows and springheads, shrubby slopes. Pl, Ro, Sk.

**3567. *Leucanthemum vulgare*** Lam., *L. praecox* (Horvatič), *Chrysanthemum leucanthemum* L. – Perennial, stems erect, 20-100 cm high, simple or ramified, bare or hirsute, flowers yellow. **Fruits achenes, cuneate with few longitudinal furrows, narrowed toward base, 2.5-2.9 x 0.8-1 mm. Surface whitish, furrows blackish with white spots. 2n = 18.** Boreal Euro-Siberian species, of meadows, embankments, forest edges and scrubs; in all Carpathian regions.

**3568. *Cotula australis*** (Sieber ex Spreng.) Hook fil. – Annual, up to 30 cm high, softy hirsute, stems divergent branched, erect. **Fruits achenes, obovoid, lateral flattish, outer achenes considerably compressed and winged, 1.4-2 x 0.9-1.1 mm, central part achenes short-hairy, greenish-brown, brim pale-green, inside achenes unwinged, 1-1.2 x 0.5-0.6 mm. Surface smooth, dorsal side**

**convex, ventral concave, brown, brim pale-brown. 2n = 40.** Native to Australia; transiently hauling into the Carpathians with wool.

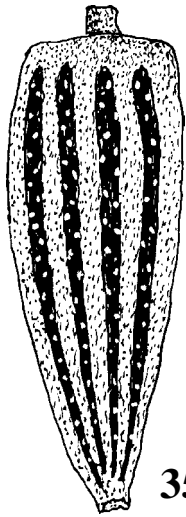
**3569. *Artemisia abrotanum*** L., *A. paniculata* Lam. – Semishrub, considerably aromatic, up to 1 m high, erect, flower panicle branched. **Fruits achenes, obovoid, ventral side with three paler ribs, apex with corona, bottom part narrowed, 1-1.2 x 0.5-0.6 mm. Surface longitudinal furrowed, greyish-white, slight lustrous. 2n = 18.** Probably native to Front Asia; in the Carpathians often cultivated for its odor in gardens, scarcely escaping.

**3570. *Artemisia absinthum*** L. – Perennial, whole plant bitterly aromatic, silverish-grey and glandularly dotted, stems 30-90 cm high, ramified. **Fruits achenes, obpyriform rounded above, narrowed below, with whitish hilum, 0.9-1.1 x 0.5-0.6 mm. Surface longitudinal fine dotted, slight lustrous, brown. 2n = 18.** Native to Eurasia, boundaries, waste places, light woods, shrubby slopes; abundant in the whole Carpathians, locally cultivated as medicinal plant.

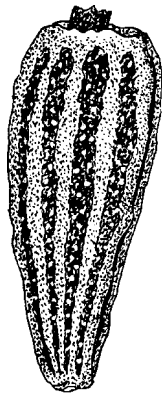
**3571. *Artemisia alba*** Turra, *A. lobelii* All. – Perennial, bare up to whitish downy, aromatic, stems woody below, ascendent, simple, rarely branched, 30-60 cm high. **Fruits achenes, obovoid, usually with small corona on upper part and with whitish hilum below, 1-1.2 x 0.5-0.6 mm. Surface with longitudinal brown furrows and whitish lustrous ridges. 2n = 36.** Native to European rocky slopes, on alkaline stony grounds. Hu, Ro, Sk.

**3572. *Artemisia annua*** L. – Annual, bare, very aromatic, stem erect, 50-150 cm high, branched above, leafy. **Fruits achenes, obovoid, often with compressed sides in bottom part, 0.9-1.1 x 0.5-0.7 mm. Surface slight longitudinal furrowed, dull or faint lustrous, greyish-white. 2n = 18.** Native to Eurasia, cultivated or escaping into waste grounds, along roads, dumps of all Carpathian territories.

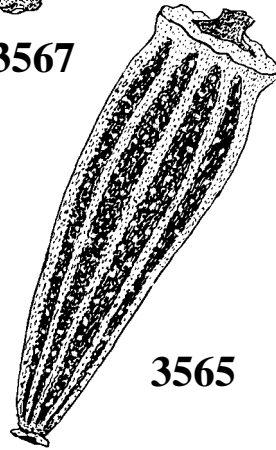
**3573. *Artemisia arenaria*** DC., *A. tschernieviana* Besser – Perennial, subfruticose, stems 50-100 cm high, more or less hairy, soon glabrescent with long, patent branches above. **Fruits achenes, oblong-obovoid, dorsal side convex, ventral slight convex, with longitudinal white rib, 1.4-1.6 x 0.5-0.6 mm. Surface longitudinal, irregular furrowed, lustrous, dark-grey.** Native to southeastern Europe, on maritime dunes. Ro, Uk.



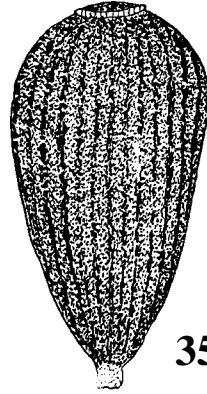
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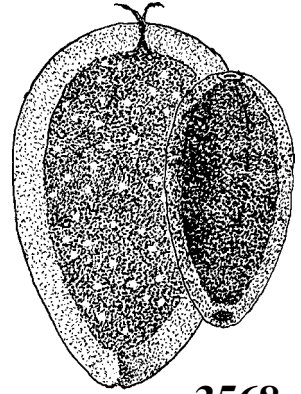
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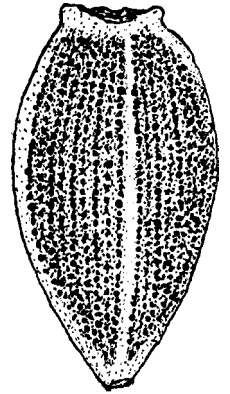
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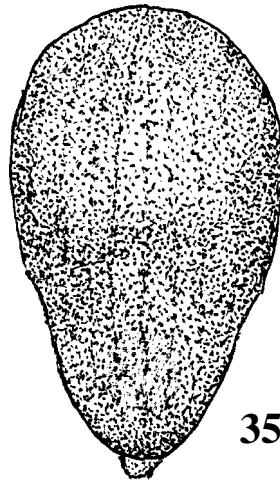
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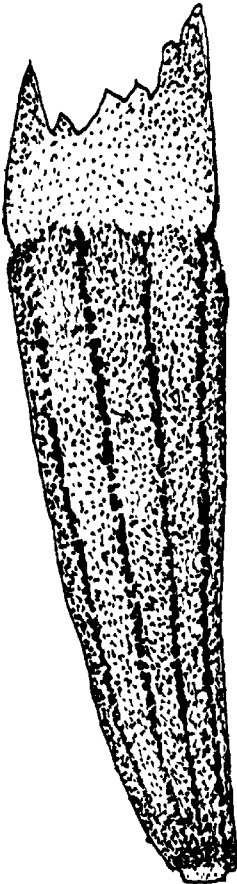
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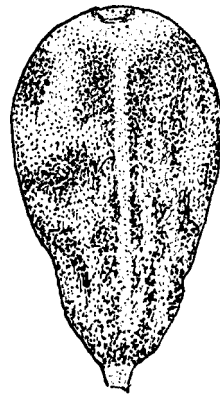
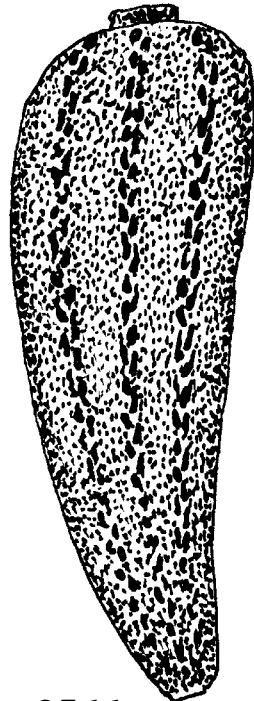
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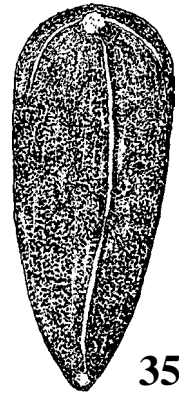
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**3574. *Artemisia austriaca*** Jacq., *A. pseudopontica* Schur — Perennial, stems erect, 20-60 cm high, woody, greyish, tomentose below, branched above, frequently reddish. **Fruits achenes, slight obovoid, corona at apex with white center, 1-1.2 x 0.6-0.7 mm. Surface longitudinally furrowed, lustrous, dark-brown, hilum white. 2n = 16.** Native to Eurasian grassy and shrubby slopes, on warmer stony grounds; in all countries of the Carpathians.

**3575. *Artemisia biennis*** Willd. — Annual to biennial, very similar to *A. annua*, slight aromatic, stems 30-100 cm high, ramified above, leafy. **Fruits achenes, oblong-obovoid, apex rounded with small whitish platform, bottom with whitish hilum, 1.1-1.3 x 0.5-0.6 mm. Surface longitudinal furrowed, lustrous, dark-brown.** Native to North America; rarely dragging with oil-seeds into ports and railway stations.

**3576. *Artemisia campestris*** L. — Perennial or semishrub, stinkless, bare or sericeous, stems ascendent or erect, 20-80 cm high, woody at base, ramified, often greyish-red. **Fruits achenes, prolonged obovoid, apex rounded with small whitish platform, 1.3-1.5 x 0.6-0.7 mm. Surface longitudinal furrowed, lustrous, dark-brown. 2n = 36.** Native to Eurasia, sunny waste places, pastures, roads, sandbanks and boundaries of all Carpathian regions.

**3577. *Artemisia caucasica*** Willd., *A. lanulosa* Klokov — Perennial, small plant, only 8-30 cm high, stems archedly erect, simple, branched. **Fruits achenes, tear-shaped, apex slight pointed or rounded, bottom narrowed from sides with whitish hilum, 1.7-1.9 x 0.7-0.8 mm. Surface furrowed only shallow, dull, brown.** Native to Eurasia, rocky, grassy grounds and steppes. Ro, Uk.

**3578. *Artemisia dracunculus*** L. — Perennial, aromatic, bare, stems tufted, erect, 60-120 cm high, densely ramified. **Fruits achenes, oblong-obovoid, apex rounded with small whitish platform, bottom with whitish hilum, 1.1-1.3 x 0.5-0.6 mm. Surface longitudinal shallow furrowed, lustrous, dark-brown. 2n = 18, 36, 90.** Native to southeastern Europe; long time ago cultivated for estragon spice in gardens, locally naturalized. Br, Hu, Mo, Sk, Uk.

**3579. *Artemisia eriantha*** Ten., *A. petrosa* subsp. *carpatica* Borza — Perennial, tufted, sericeous, stems ascendent, up to 25 cm high, branchless, leafy. **Fruits achenes, claviform with small corona at apex**

**and hyaline stripes at bottom, 2-2.3 x 0.9-1.1 mm. Surface rough with some long hairs mostly at apex, dull, brown. 2n = 18.** Native to the Alps and Carpathians, rocks and reinforced screes on calcareous, stony grounds. Hu, Pl, Ro, Sk.

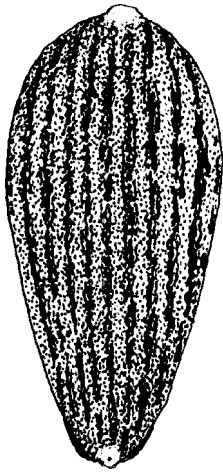
**3580. *Artemisia laciniata*** Willd. — Perennial, tufted, stems 15-30 cm high, ascendent, glabrous or sparsely pubescent above, leaves bare or cobwebby lanate, corolla yellow. **Fruits achenes, obovoid, apex round, below half gradually narrowed, crest absent, 1.3-1.5 x 0.7-0.9 mm. Surface smooth, faint lustrous, dark-grey. 2n = 18.** Native to temperate Asia, rarely hauling into the Carpathians and temporarily naturalized.

**3581. *Artemisia lerchiana*** Weber, *A. taurica* auct. non Willd. — Perennial, stems 35-60 cm high, erect, tomentose, leafy, branched above. **Fruits achenes, obovoid with acuminate bottom, apex round, with whitish platform, 1.5-1.7 x 0.8-1 mm. Surface dense and shallow longitudinal furrowed, grey, dull.** Native to European dry plains. Ro, Uk.

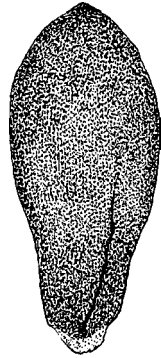
**3582. *Artemisia pontica*** L. — Perennial, slight aromatic, greyish tomentose, stems erect, 40-80 cm high, densely leafy. **Fruits achenes, obovoid, ventral side apex with corona, 1.6-1.8 x 0.7-0.9 mm. Surface longitudinal furrowed with many hyaline excrescences at ribs, dull, pale- to dark-brown. 2n = 18.** Native to Euro-Siberia, grassy steppe uplands, field roads, waste places and old vineyards. Hu, Pl, Mo, Ro, Sk, Uk.

**3583. *Artemisia santonicum*** L., *A. maritima* subsp. *monogyna* auct. non (Waldst. et Kit.) Gams — Perennial, woody and bare stems at base, 10-40 cm high, ascendant or erect, branched. **Fruits achenes, claviform with roughened apex and narrowed bottom, 1.5-1.8 x 0.8-1 mm. Surface longitudinal many-ribbed, furrows darker, ribs paler, faint lustrous, silverish-grey. 2n = 18.** Native to European dry and saline grounds. Hu, Mo, Ro, Sk, Uk.

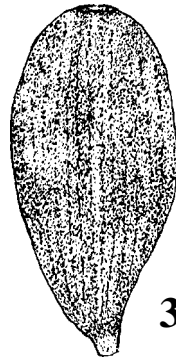
**3584. *Artemisia scoparia*** Waldst. et Kit. — Biennial, similar to *A. campestris*, stems erect or ascendent, 30-100 cm high, bare, often brownish-red. **Fruits achenes obovoid, bottom part often flat-tish from sides, with small white platform at apex, 0.8-1 x 0.4-0.5 mm. Surface longitudinal shallow furrowed, slight lustrous, dark-brown. 2n = 16.** Native to Eurasia, pastures, steppe uplands, waste



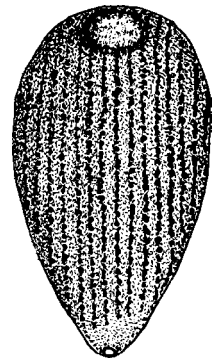
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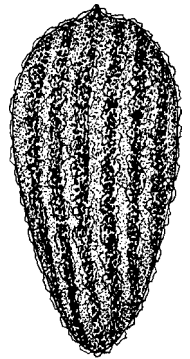
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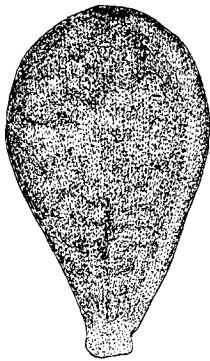
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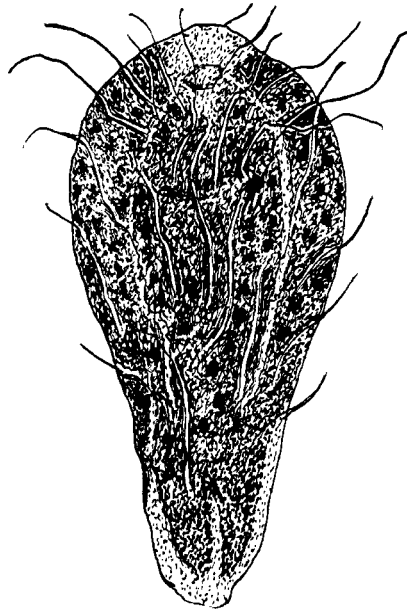
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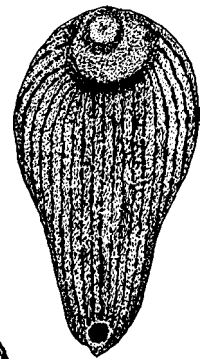
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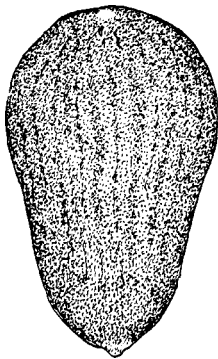
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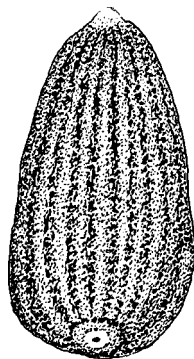
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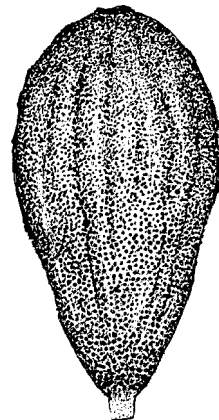
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places, boundaries and rocks in warmer areas; in all Carpathian regions.

**3585. *Artemisia sieversiana*** Ehrh. ex Willd. — Annual to biennial, similar to *A. absinthum*, stems 30-100 cm high, striate, simple or ramified from base. **Fruits achenes, obpyriform rounded above, narrowed below, hilum whitish, 0.8-1 x 0.4-0.5 mm. Surface longitudinal furrowed, slight lustrous, brown. 2n = 18.** Native to Eurasia; often hauling into the Carpathians, railway stations, dumps and ports. Mo, Sk.

**3586. *Artemisia verlotiorum*** Lamotte — Perennial, caespitose, aromatic, stems 120-200 cm high, more densely pubescent, with overwintering leaf rosettes. **Fruits achenes, cylindric, narrowed above and below, apex with hilumous ring, without crest, 1.7-2 x 0.4-0.5 mm. Surface smooth, fine striate, faint lustrous, dark-grey. 2n = 54.** Native to south-western China, rarely hauling into the Carpathians and naturalized on roadsides and in waste places.

**3587. *Artemisia vulgaris*** L. — Perennial, tufted, disagreeably stinking, stems 60-120 cm high, erect, angular, richly paniculate, sometimes reddish, flowers yellowish to reddish-brown. **Fruits achenes, spindle-shaped, with one stripe on dorsal and two stripes on ventral side, truncate above, narrowed below, 1.5-1.9 x 0.5-0.6 mm. Surface fine pitted, lustrous, dark-brown. 2n = 16.** Native to Eurasia, secondary cosmopolitan of waste grounds, dust heaps, roads and coastal shrubberies in all Carpathian territories.

**3588. *Tussilago farfara*** L. — Perennial, stems erect, branchless, scaly, 20-30 cm high when bearing fruits. **Fruits achenes, oblong, with five longitudinal ribs and one-row crest from glossy-white, rough bristles, 3.2-3.6 x 0.5-0.6 mm. Surface smooth, slight lustrous, pale-brown. 2n = 60.** Native to Eurasia, coasts, embankments, fields and grassy grounds; currently found in all Carpathian regions.

**3589. *Petasites albus*** (L.) P. Gaertn., *Tussilago alba* L. — Perennial, flowering stems up to 80 cm, non-flowering 30 cm high. **Fruits achenes, cylindric, apex truncate, with white bristles 3-4x longer than the achene, bristles single, 2.4-2.8 x 0.5-0.6 mm. Surface longitudinal furrowed and ribbed, faint lustrous, brown. 2n = 60.** Native to Eurasia, moist woody places, boundaries, springheads, near brooks. Hu, Pl, Ro, Sk, Uk.

**3590. *Petasites hybridus*** (L.) Gaertn., *P. officinalis* Moench — Perennial, disagreeable stinking, stems erect, in fruit time 70-100 cm high, densely scaly. **Fruits achenes, oblong-flattish, seldom cylindric with whitish crest and hilum, bristles long, 2.4-2.8 x 0.4-0.5 mm. Surface shallow longitudinal furrowed, dull, reddish-brown. 2n = 60.** Native to Eurasia, river and brook sides, wet meadows; in all Carpathian regions.

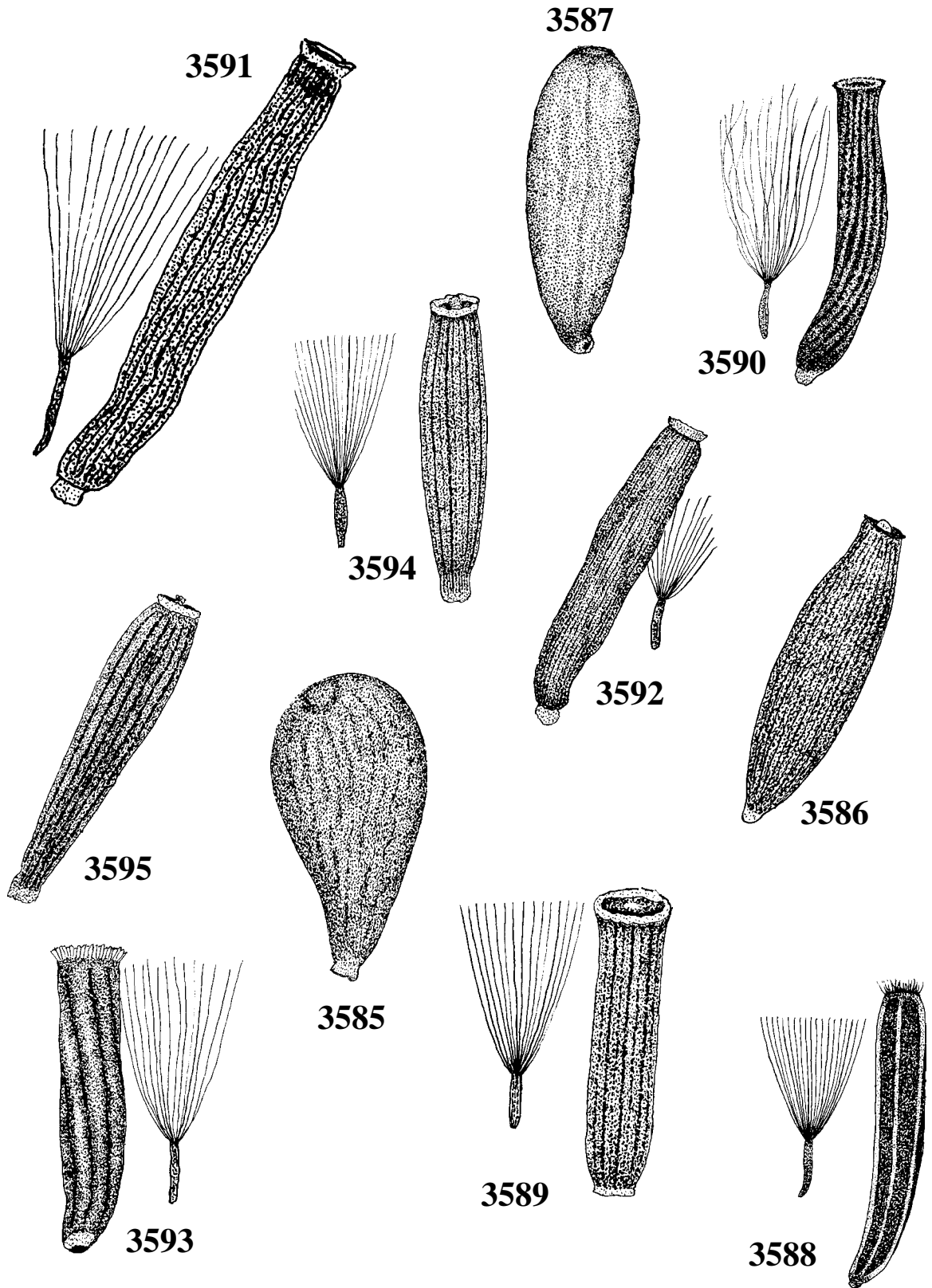
**3591. *Petasites kablikianus*** Tausch ex Bercht., *P. glabratus* (Maly) Borbás — Perennial, non-flowering stems 10-30 cm, flowering ones 40-50 cm long, female plant thick, fleshy, tomentose, glandular. **Fruits achenes, oblong, flattish or ± cylindric, narrow, white bristles 2x longer than the achene, 3.8-4.2 x 0.4-0.6 mm. Surface longitudinal striate, lustreless, brown. 2n = 60.** Native to Europe, moist screes, brookbanks, stony and loamy soils. Pl, Ro, Sk, Uk.

**3592. *Petasites paradoxus*** (Retz.) Baumg., *Tussilago paradoxus* Retz. — Perennial, non-flowering stems up to 30 cm, fruitful 60 cm, female plant thick, fleshy, glandular, tomentose. **Fruits achenes, prolonged cylindric, compressed, narrow, white bristles 2x as long as the achene, 3.4-3.8 x 0.6-0.7 mm. Surface longitudinal striate, slight lustrous, brown.** Native to southern Europe (Alps), near springheads, moist woods of montane and subalpine zones. Ro (?).

**3593. *Petasites spurius*** (Retz.) Rchb., *Tussilago spuria* Retz. — Perennial, stems in fruit time 30-80 cm, white or greyish tomentose. **Fruits achenes, oblong cylindric or flattish, with some deep furrows, apex with low coronelet and white bristles, 3-3.4 x 0.5-0.7 mm. Surface dull, brown.** Native to European marine sands. Mo, Pl, Ro, Uk.

**3594. *Homogyne alpina*** (L.) Cass., *Tussilago alpina* L. — Perennial, stems 10-40 cm high, erect, simple, villously hirsute above. **Fruits achenes, cylindric, apex with crest rim, bristles 2x as long as the achene, 4-5 x 0.8-0.9 mm. Surface longitudinal shallow furrowed, dull, pale-brown or reddish-brown. 2n = 120, 140, 160.** Native to European moist woods and dwarf pine areas, mountain meadows and pastures. Pl, Ro, Sk, Uk.

**3595. *Homogyne sylvestris*** (Scop.) Cass., *Tussilago sylvestris* Scop. — Perennial, stems 15-45 cm high, erect or flexuous with one flower-head. **Fruits**



achenes, cylindric, apex with crest rim, bristles as long as the achene, bottom with pale hilum, 5-5.5 x 0.8-1 mm. Surface longitudinal furrowed, ribs smooth, dull, brown. Native to Europe (Alps and Balkan mountains), in subalpine or alpine zones, very rare. Ro.

**3596. *Adenostyles alliariae*** (Gouan) A. Kern., *A. albida* Cass., *A. albifrons* Rchb. — Perennial, stems erect, 60-200 cm high, rough, branched above, grooved, lanate. **Fruits achenes, cylindric with crest rim above, bristles a little longer than the achene, 4-5 x 0.8-0.9 mm. Surface longitudinal furrowed smooth, dull, brown. 2n = 38.** Native to European mountain forests and dwarf pine areas, mountain meadows and springheads. Pl, Ro, Sk, Uk.

**3597. *Arnica montana*** L. — Perennial, aromatic, stems erect, 20-60 cm high or poorly ramified above. **Fruits achenes, longitudinal ribbed (4 ribs) or without ribs, bristles as long as the achene, 6-8 x 0.9-1.1 mm. Surface more or less flattish, hirsute, dull, blackish-brown. 2n = 38.** Native to European meadows, pastures, heaths, forest clearings and peat-bogs, in subalpine and montane zones. Br, Hu, Pl, Ro, Uk.

**3598. *Doronicum austriacum*** Jacq., *D. orphanidis* Boiss. — Perennial, stems erect, 30-150 cm high, angular, leafed, poorly ramified above, flowers yellow. **Fruits achenes, conical, longitudinal ribbed with or without bristles above, 2.4-3 x 1.1-1.3 mm. Surface hirsute, dull, ribs dirty-yellow, furrows dark, bristles yellowish. 2n = 60.** Native to Europe, in humous forests, dwarf pine areas, riverbanks and mountain meadows. Hu, Pl, Ro, Sk, Uk.

**3599. *Doronicum carpaticum*** (Gris. et Sch.) Nym., *Arnica scorpioides* Baumg. — Perennial, stems 10-50 cm high, bended at base, erect, flexuous, glabrous or scarcely hirsute. **Fruits achenes, obconic with 10 longitudinal ribs and whitish bristles 1.5x longer than the achene, 1.8-2.2 x 0.8-1 mm. Surface hirsute, lustreless, brownish-green.** Native to European woods and their margins, forest meadows, rocky hills of lowland and upland zones. Pl, Ro, Sk, Uk.

**3600. *Doronicum columnae*** Ten., *D. cordifolium* Sternb. — Perennial, stems 20-60 cm high, bare or downy, flowers yellow. **Fruits achenes, weakly obconic, longitudinal furrowed, with whitish bristles, 1.5-2 x 0.9-1.1 mm. Surface smooth, hirsute, dull, greenish- to pale-brown. 2n = 60.** Native to

Europe (Alps and East Carpathians), rocky and grassy grounds along brooks, in subalpine and alpine zones, sometimes cultivated as an ornamental in gardens. Ro, Sk.

**3601. *Doronicum grandiflorum*** Lam., *Arnica scorpioides* L. — Perennial, stems 12-55 cm high, cylindric, moderately hirsute and glandular. **Fruits achenes, cylindric or clavate, longitudinal furrowed and ribbed, apex with bristles, 3.6-4 x 1.3-1.5 mm. Surface smooth, hirsute, dull, pale-brown.** Native to Europe, screes and stony grassy slopes of the moist subalpine zones. Ro.

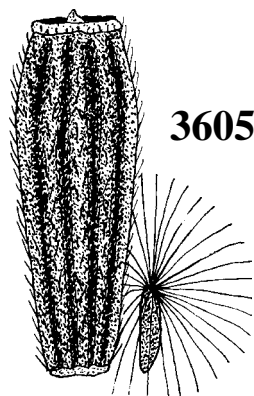
**3602. *Doronicum orientale*** Hoffm., *D. caucasicum* M. Bieb. — Perennial, whole plant shortly hirsute, stems 15-60 cm high, densely leafed below. **Fruits achenes, obovoid or conic, furrowed and ribbed, crest with thorny bristles, 2.4-2.8 x 1-1.2 mm. Surface hirsute, dull, greenish to pale-brown. 2n = 60.** Native to southeastern Europe, forests and shrubberies, very rare. Hu, Ro, Sk.

**3603. *Doronicum pardalianches*** L. — Perennial, stems up to 90 cm high,  $\pm$  pubescent, basal leaves ovate-orbicular, cordate, pubescent, dentate to subentire. **Fruits achenes, oblong, obovoid, in transversal section  $\pm$  roundish, longitudinal with  $\pm$  10 furrows and ribs, marginal achenes stronger and without bristles, 2-2.4 x 1-1.2 mm. Surface smooth, dull, brownish-black to black. 2n = 60.** Native to western Europe, mostly in woods; in the Carpathians cultivated for ornament in gardens and uniquely naturalized. Pl, Ro, Sk, Uk.

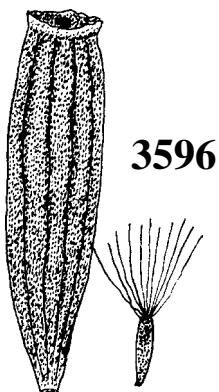
**3604. *Doronicum plantagineum*** L., *D. hungaricum* (Sadl.) Rchb. fil. — Perennial, stems erect, non-branched, up to 80 cm high, glabrous below, pubescent above, scarcely leafy, basal leaves ovate-elliptical, entirely or weakly dentate. **Fruits achenes, longitudinal furrowed and ribbed, apex with or without bristles (marginal seeds), 2.2-2.6 x 0.9-1.1 mm. Surface hirsute, dull, brown. 2n = 60, 120.** Native to western Europe, in woods, forest borders, shrubberies and grassy slopes, pastures and heaths; in the Carpathians cultivated as an ornamental mostly in parks, less in gardens. Hu, Mo, Ro, Sk, Uk.

**3605. *Doronicum styriacum*** (Vill.) Dalla Torre, *D. clusii* (All.) Tausch, *Aronicum clusii* (All.) Koch — Perennial, stems shortly ascendent up to erect, non-branched, 10-35 cm high, with single flower head. **Fruits achenes, cylindric with ribs, furrows, bris-**

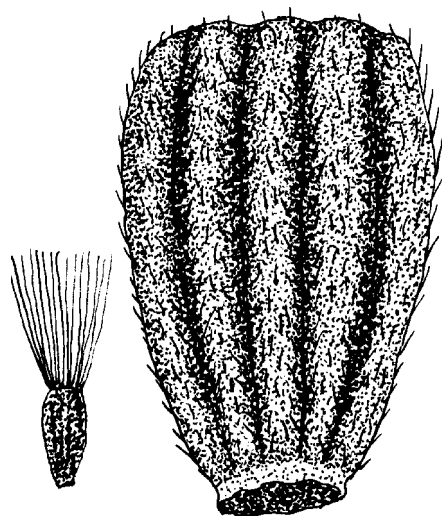




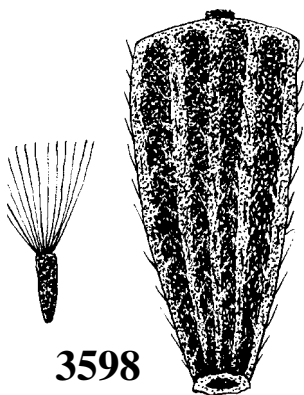
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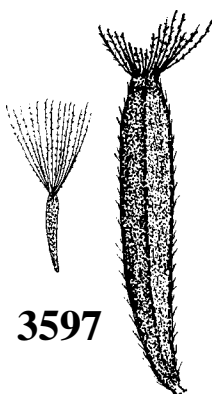
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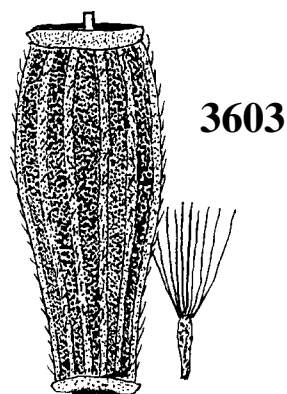
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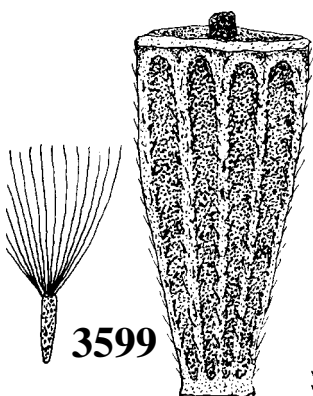
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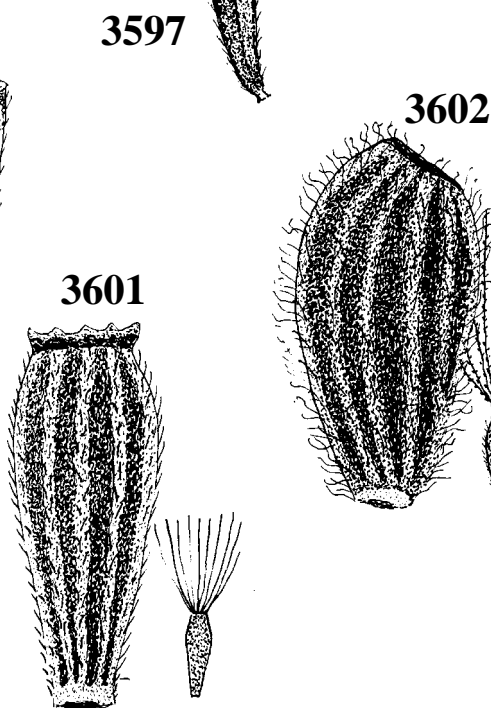
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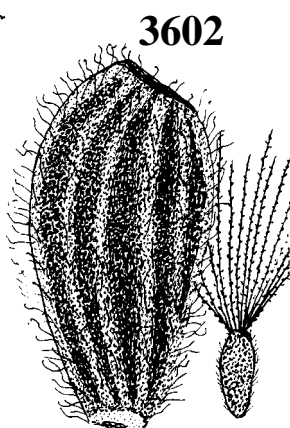
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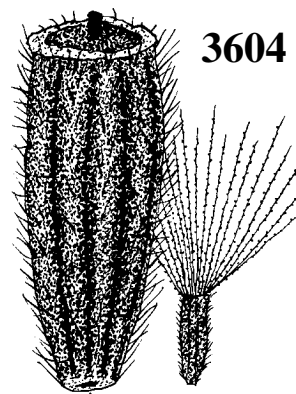
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gles, 3.6-4 x 1.3-1.4 mm. Surface smooth, hirsute, dull, pale-brown, bristles yellowish.  $2n = 120$ . Native to Europe, grassy and stony mountain meadows, dwarf pine areas, overgrown screes and snow deck-chairs. Sk.

**3606. *Erechtites hieraciifolia* (L.) Raf. ex DC., *Senecio hieraciifolius* L.** — Annual, stems erect, hollow, ramified above, 50-100 cm high, furrowed. **Fruits achenes, cylindric, often little crooked, longitudinal furrowed and ribbed, apex with bristles, 2.4-3 x 0.5-0.7 mm. Surface smooth, dull, modest hirsute, ribs brown, furrows dark-brown.  $2n = 40$ .** Native to North America; hauling into cut-over areas, shrubberies, stone-pits and domesticated. Hu, Pl, Ro, Sk, Uk.

**3607. *Senecio abrotanifolius* L., *S. carpathicus* Herbich** — Perennial, stem procumbent, ascending later on, 10-20 cm high, flower head always single. **Fruits achenes, cylindric with longitudinal ribs and furrows, crest with fine bristles, 2-2.5 x 0.8-1 mm. Surface smooth, sparsely and fine hirsute, pale- or dark-brown.  $2n = 40$ .** Native to Europe (Carpathians and Balkan Peninsula) on grassy and stony slopes, reinforce screes on neutral to acid grounds. Pl, Ro, Sk, Uk.

**3608. *Senecio aquaticus* Hill** — Biennial, stems 25-60 cm high, erect, ramified, feebly angular. **Fruits achenes, cylindric with fine white crest, bristles 2x longer than the achene, 1.7-2 x 0.6-0.8 mm. Surface glabrous with drab (indistinct) ribs, pale-yellowish, fine whitish hirsute.  $2n = 40$ .** Native to Europe, moist meadows and pastures, coastal bushes. Hu, Pl, Ro.

**3609. *Senecio cacaliaster* Lam., *S. croaticus* Waldst. et Kit.** — Perennial, stems erect, 60-120 cm high, finely furrowed, glabrous, sometimes branched. **Fruits achenes, cylindric, lateral compressed, dorsal side convex with 3 brown stripes, ventral side concave with 2 brown stripes, apex truncate with collar and rest of carpel, bristles longer than the achene, 4-4.6 x 0.9-1.1 mm. Surface glabrous, lustrous, whitish-brown.** Native to southern Europe, rocky and woody growths, very rare. Ro.

**3610. *Senecio capitatus* (Wahlenb.) Steud., *Tephrosia capitata* (Wahlenb.) Holub** — Perennial, stems 10-40 cm high, greyish-white, downy. **Fruits achenes, cylindric, tapered at both ends, with emerging ribs, apex with white bristles, 4-4.5 x 1-1.3 mm. Surface hirsute or glabrous, slight**

**lustrous, grey or brown.  $2n = 64$ .** Native to Europe (Alps and Carpathians), mountain meadows and pastures, forest clearings, dwarf pine areas on calcareous grounds. Hu, Pl, Ro, Sk, Uk.

**3611. *Senecio carniolicus* Willd., *S. incanus* L. subsp. *carniolicus* (Willd.) Br.-Bl.** — Perennial, grey to white tomentose, stems erect, 5-20 cm high, non-branched. **Fruits achenes, cylindric with longitudinal furrows, often crooked, apex with bristles, 3-4 x 0.7-0.8 mm. Surface smooth, dull, ribs greyish, furrows brown.  $2n = 140$ .** Native to Europe, grassy and stony mountain meadows, reinforced screes on neutral and acid soils. Pl, Ro, Sk, Uk.

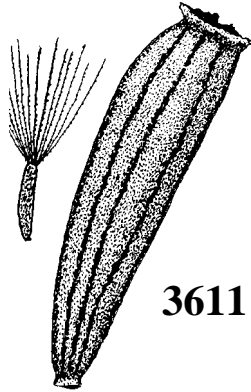
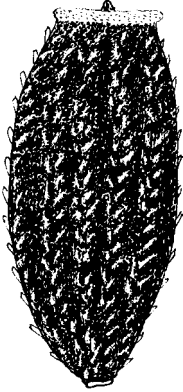
**3612. *Senecio cineraria* DC., *Cineraria maritima* L.** — Perennial, stems 40-80 cm high, white tomentose, leafed, ramified. **Fruits achenes, cylindric, longitudinal furrowed, bristles whitish, c. 5 mm long, 2-2.5 x 0.7-0.8 mm. Surface glabrous, lustrous, yellowish-brown, furrows brown.** Native to the Mediterranean; cultivated in gardens, usually planted as an ornamental plant suitable for flower-bed margins. Uk.

**3613. *Senecio congestus* (R. Br.) DC., *S. palustris* (L.) Hooker non Velloso** — Perennial, stems erect, 30-200 cm, hollow, branched, in only inflorescence, glandular, downy. **Fruits achenes, cylindric with winged ribs, bristles white, 3-3.6 x c. 0.6 mm. Surface glabrous, dull, whitish-yellow.  $2n = 48$ .** Native to Eurasia, swamps and peatbogs, muddy banks of stagnant waters. Ro, Sk.

**3614. *Senecio cruentus* (Mass.) DC., *Cineraria hybrida* Willd.** — Perennial, stems erect, 40-60 cm high, ramified above, pubescent. **Fruits achenes, cylindric, strong narrowed at both ends, longitudinal ribbed and furrowed, 1.6-2 x 0.7-0.8 mm. Surface smooth, short white bristles in furrows, lustreless, violetish-black.** Native to the Canary Islands; commonly cultivated as an ornamental in flowerpots, in greenhouses and interiors.

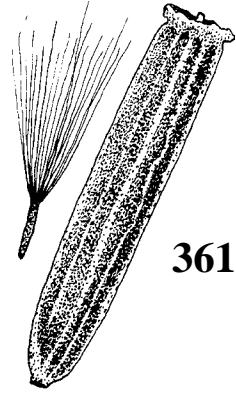
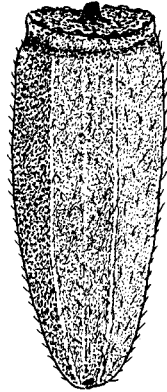
**3615. *Senecio doria* L., *S. altissimus* Mill.** — Perennial, stems erect, ramified above, scutate below. **Fruits achenes, cylindric or claviform, longitudinally furrowed, apex with whitish bristles, bottom narrow, 3.6-4 x 1-1.2 mm. Surface smooth, slight lustrous, brownish-grey, furrows brown.  $2n = 40$ .** Native to Eurasia, dry meadows, pastures and boundaries of the lowland zone, rare. Hu, Pl, Ro, Sk.

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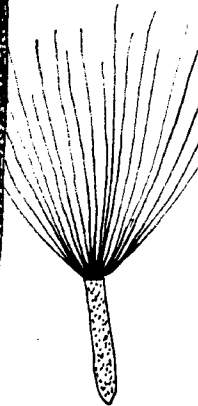
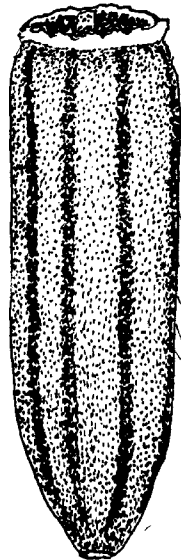
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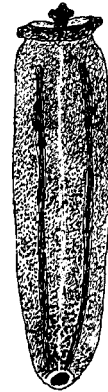


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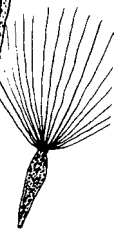
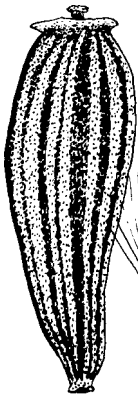
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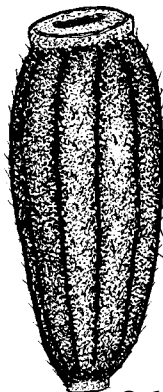
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**3616. *Senecio erraticus*** Bertol., *S. barbaraeifolius* L. — Biennial, stem erect, dark-green, richly branched, 60-120 cm high, cobwebby lanate or bare. **Fruits achenes, cylindric with paler ribs, bristles 2x longer than the achene, 1.5-2 x 0.5-0.6 mm. Surface glabrous, lustreless, dirty-yellow. 2n = 40.** Native to Eurasia, coastal shrubs, lowland forests, forest clearings, wet meadows, waste places and fallows. Hu, Sk, Uk.

**3617. *Senecio erucifolius*** L. — Perennial, stems erect, 50-120 cm high, angular, bare or cobwebby, upper part branched. **Fruits achenes, cylindric, longitudinal ribbed and furrowed, pale-yellowish, bristles non-deciduous, 2-2.4 x 0.6-0.7 mm. Surface dense short hirsute, yellowish, furrows brown. 2n = 40.** Native to Eurasia, sunny, shrubby slopes, vineyards and forest margins; in all Carpathian territories.

**3618. *Senecio fluviatilis*** Wallr., *S. sarracenicus* L. p. p. — Perennial, stems erect, 60-200 cm high, sometimes ramified, downy below, bare above. **Fruits achenes, clavate, lower part crooked, bristles at apex 3x longer than the achene, 3.4-3.8 x 0.8-1 mm. Surface smooth, slight lustrous, greyish, furrows brown. 2n = 40.** Native to Eurasia, coastal shrubberies, reed swamps, lowland woods, sandy and loamy soils. Hu, Mo, Pl, Ro, Sk, Uk.

**3619. *Senecio fuchsii*** C. C. Gmel., *S. nemorensis* L. subsp. *fuchsii* (C. C. Gmel.) Čelak. — Perennial, very similar to *S. nemorensis*, stems erect, stiff, often purple colorific, bare. **Fruits achenes, cylindric, longitudinal furrowed, apex bristles whitish, 3.7-4.3 x 0.7-0.9 mm. Surface smooth, slight lustrous, greyish, furrows brown. 2n = 40.** Native to Europe, mountain forests and shrubberies. Hu, Pl, Sk, Uk.

**3620. *Senecio germanicus*** Wallr. — Perennial, stems erect, poorly ramified and downy above, densely leafed below. **Fruits achenes, cylindric with longitudinal furrows, white bristles at apex longer than the achene, 4-5 x 0.8-1 mm. Surface smooth, slight lustrous or dull, greyish-brown, furrows dark-brown. 2n = 40.** Native to Europe, high-mountain shrubberies, brookbanks, forest clearings, mountain meadows and glacial screes. Hu, Pl, Sk.

**3621. *Senecio glabellus*** Poir. — Perennial, stems erect, 5-50 cm high, leafed, little crooked, glabrous. **Fruits achenes, cylindric, longitudinal ribbed and furrowed, 4.5-5 x 0.9-1.1 mm. Surface glabrous, lustreless, yellowish-brown, furrows darker.** Native

to the Carpathians and the Balkan mountains, coasts, rocks, reinforced screes of subalpine and alpine zones, rare. Ro.

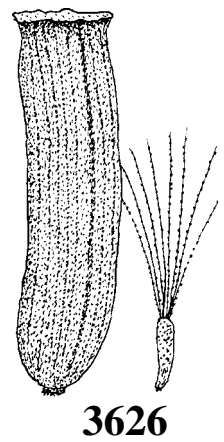
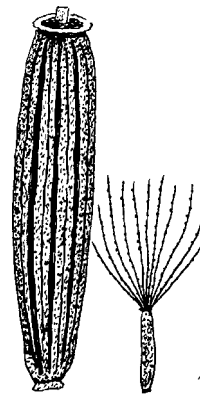
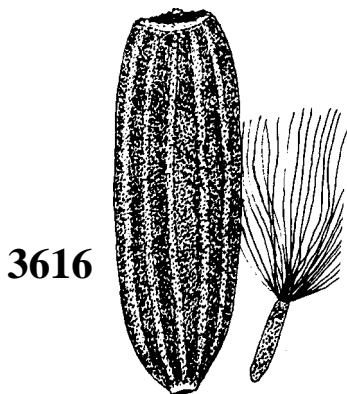
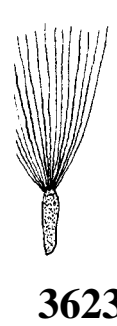
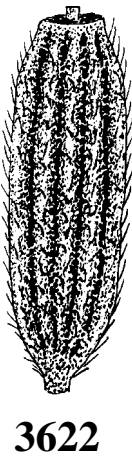
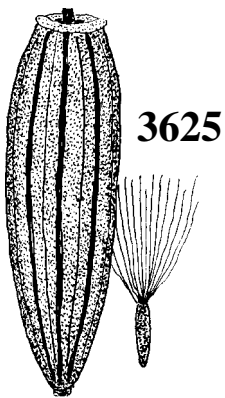
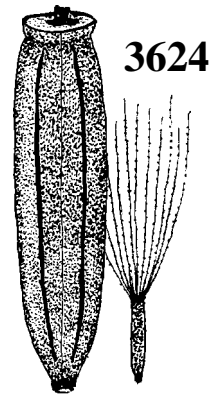
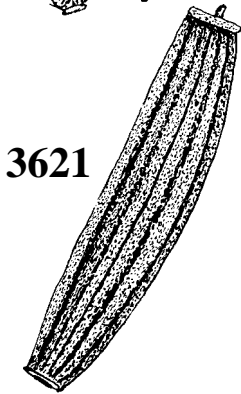
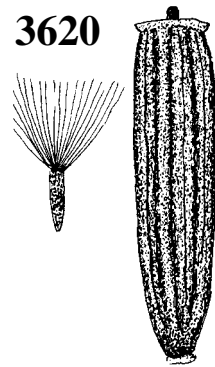
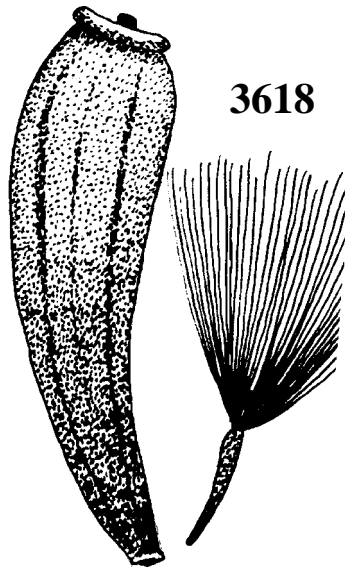
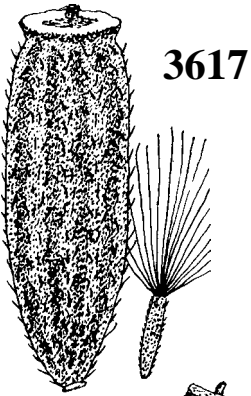
**3622. *Senecio integrifolius*** (L.) Clairv., *S. aurantiacus* (Hoppe ex Willd.) Less., *S. campestris* (Retz.) DC. — Perennial, stems erect, 10-100 cm high, unramified, sparsely leafed. **Fruits achenes, cylindric, with white bristles at apex, longitudinal furrowed, 2-2.6 x 0.5-0.6 mm. Surface hirsute, lustrous, grey, furrows brown. 2n = 48, 96.** Native to Eurasia, dry meadows, steppes and scrubby slopes of lowland and montane zones. Hu, Pl, Ro, Sk.

**3623. *Senecio jacobaea*** L., *S. montanus* Kit. — Perennial, stems erect, 30-120 cm high, angular, cobwebby lanate, bare later on, leafy. **Fruits achenes, cylindric, minute ribbed, bristles white, deciduous, 2x longer than the achene, internal achenes hairy, external achenes bare, 1.9-2.3 x 0.6-0.7 mm. Surface smooth, fine hirsute, dull, whitish-yellow. 2n = 40-80.** Native to Eurasia, grassy and shrubby sunny slopes and pastures, overgrown rocks and stone-pits, boundaries and wood margins. Hu, Mo, Pl, Ro, Sk, Uk.

**3624. *Senecio nemorensis*** L., *S. ovatus* Baumg., *S. jacquinianus* Schur — Perennial, stems 50-100 cm high, erect, rarely or only above little branched, densely leafy up to the top. **Fruits achenes, cylindric, apex with slight yellowish bristles, 3.6-4 x 0.8-1 mm. Surface longitudinal furrowed, dull, pale-brown. 2n = 40.** Native to Europe, humous woods, valley flood plains, deep river, valleys of the montane zone, abundant. Hu, Pl, Ro, Sk, Uk.

**3625. *Senecio ovirensis*** (Koch) DC., *S. alpestris* (Hoppe) DC., *Tephrosieris longifolia* (Jacq.) Griseb. et Schenk — Perennial, stems erect, 20-80 cm high, cobwebby lanate, rarely subglabrous. **Fruits achenes, ± cylindric or spindleform, longitudinal broader and narrower furrowed, apex truncate with white bristles, bottom narrowed, 4-4.5 x 1-1.2 mm. Surface glabrous, dull, brown. 2n = 46-50.** Native to Europe, forest margins and meadows. Hu.

**3626. *Senecio paludosus*** L. — Perennial, stems erect, 50-200 cm high, hollow, grooved, scaly at bottom. **Fruits achenes, cylindric with very shallow furrows and white bristles, 2.6-3.2 x 0.6-0.8 mm. Surface glabrous or scattered hirsute, pale- or dark-brown. 2n = 40.** Native to Euro-Siberian, riverbanks, peat-



bogs, swamps, wet meadows and lowland woods. Br, Hu, Pl, Ro, Sk, Uk.

**3627. *Senecio papposus*** (Rchb.) Less., *Cineraria papposa* Rchb. — Perennial, stems 30-130 cm high, erect, glabrous at base, scabrous above. **Fruits achenes,  $\pm$  cylindric, apex truncate with white bristles, bottom slight narrowed, 3-3.5 x 0.7-0.9 mm. Surface glabrous, sometimes weak hairy, dull, brown.  $2n = 40$ .** Native to the Balkan Peninsula, stony or grassy, usually dry places and mountain meadows. Pl, Ro, Uk.

**3628. *Senecio rivularis*** (Waldst. et Kit.) DC., *Tephrosia crispa* (Jacq.) Schur — Perennial, stems erect, 20-80 cm high, flaky lanate. **Fruits achenes, cylindric, longitudinal furrowed, apex with white bristles, 3.5-4 x 0.7-0.8 mm. Surface glabrous, dull, brown.  $2n = 48$ .** Native to Europe, near springheads, brookbanks, floodplains, wet woods and places. Br, Hu, Pl, Ro, Sk, Uk.

**3629. *Senecio rupestris*** Waldst. et Kit., *S. nebrodensis* auct. non L., *S. squalidus* L. — Biennial, stem erect, 30-60 cm high, ramified above, weakly angular, faintly cobwebby. **Fruits achenes, cylindric, straight, sometimes crooked, bristles 2x as long as the achene, 2.5-3 x 0.4-0.5 mm. Surface smooth, furrows strong hirsute, lustreless, greyish.  $2n = 20$ .** Native to Europe, stony and shrubby slopes, light woods and overgrown rocks, in montane and alpine zones, often in groups. Hu, Sk.

**3630. *Senecio schvetzovii*** Korsh., *S. macrophyllus* auct. non M. Bieb. — Perennial, stems 50-100 cm high, tongue flowers 5-8, flower head 4-6 mm in diam. **Fruits achenes, cylindric, apex with bristles, 2x longer than the achene, 1.8-2 x 0.5-0.6 mm. Surface longitudinal furrowed, dense, short hairy, lustreless, pale-brown.** Native to southeastern Europe, dry, rarely moist or saline grounds and meadows, chalky strips. Uk.

**3631. *Senecio subalpinus*** W. D. J. Koch, *Cineraria cordifolia* Baumg. — Perennial, stems erect, 30-70 cm high, angular, leafed, sparsely lanate, branched in inflorescence. **Fruits achenes, cylindric, shallow or without longitudinal furrows, apex bristles whitish, 3.5-4 x 0.7-0.8 mm. Surface smooth, dull, whitish-yellow.  $2n = 40$ .** Native to Europe, mountain meadows, springheads, moist woods and dwarf pine areas. Pl, Ro, Sk, Uk.

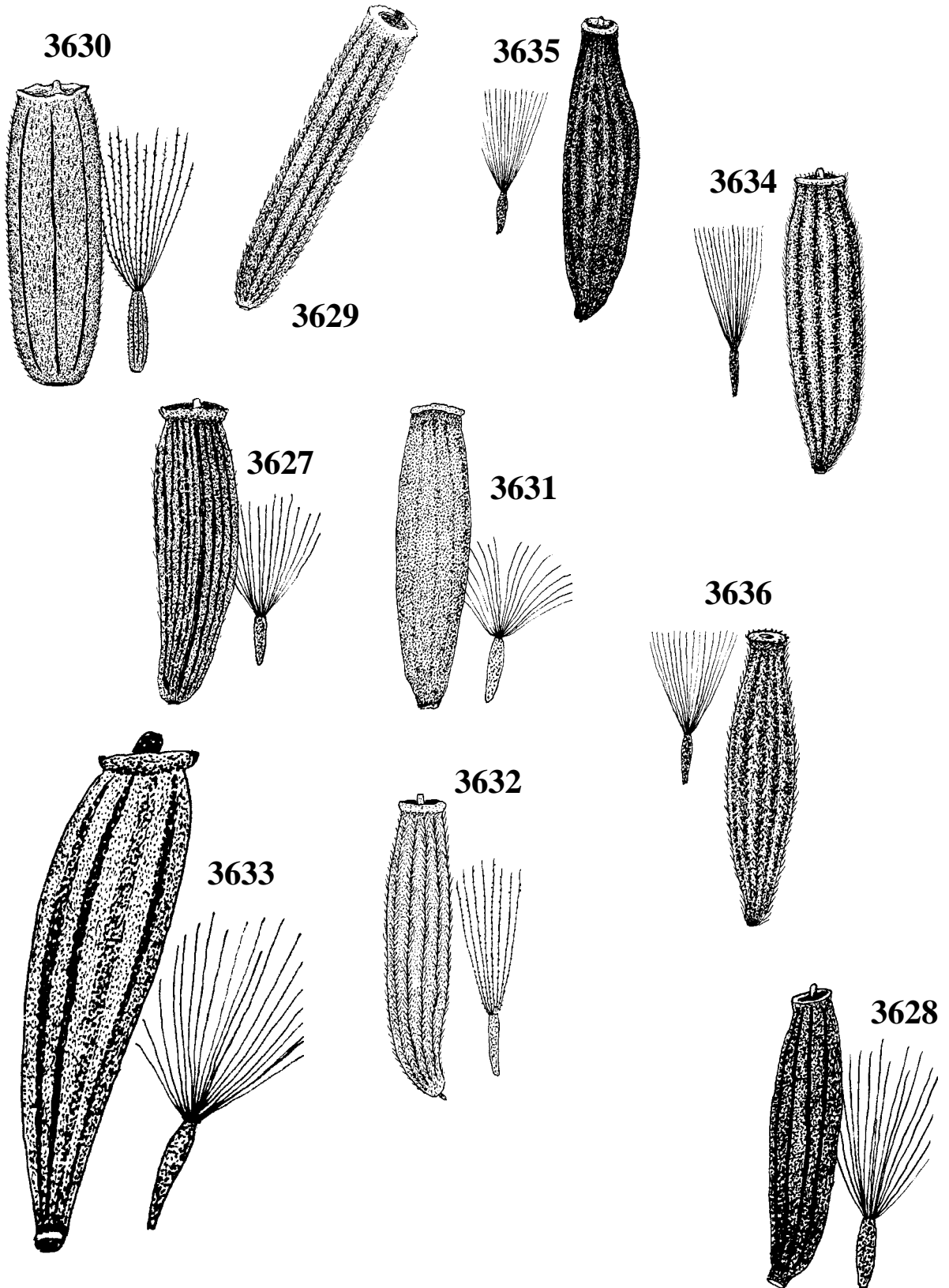
**3632. *Senecio sylvaticus*** L. — Annual, stems erect, 30-60 cm high, angular, cobwebby lanate, glandular in inflorescence. **Fruits achenes, cylindric, longitudinal ribbed and furrowed, bristles dirty-white, soft, 2x longer than the achene, 2-2.4 x 0.4-0.5 mm. Surface smooth, furrows with white short bristles, lustreless, dark-violet.  $2n = 40$ .** Native to Europe, forest clearings and margins, cut-over areas, sandbanks and boundaries. Hu, Pl, Ro, Sk, Uk.

**3633. *Senecio umbrosus*** Waldst. et Kit., *S. doria* L. subsp. *umbrosus* (Waldst. et Kit.) Soó — Perennial, stems erect, rough, 50-150 cm high, simple, leafed, angular, downy. **Fruits achenes, claviform or cylindric, often crooked, apex with white bristles, 4-4.6 x 0.9-1.1 mm. Surface glabrous, dull or slight lustrous, greyish-brown, furrows brown.  $2n = 40$ .** Native to Europe, light woods, shrubby slopes and boggy meadows of the montane zone. Hu, Pl, Sk, Uk.

**3634. *Senecio vernalis*** Waldst. et Kit., *S. squalidus* Schur — Perennial, stems erect, 10-50 cm high, simple, flimsy cobwebby, leafed. **Fruits achenes, cylindric, longitudinal ribbed and furrowed, bristles white and lustrous, 2 or more times longer than the achene, 2.3-3 x 0.5-0.7 mm. Surface with adpressed short bristles, lustreless, greyish or pale-brown.  $2n = 20, 40$ .** Native to Eurasia, often as a field weed, along roads and barren grounds. Hu, Mo, Pl, Ro, Sk, Uk.

**3635. *Senecio viscosus*** L. — Annual, stinking disagreeably, sticky glandular and cobwebby lanate, stems erect, 20-70 cm high, often crooked. **Fruits achenes, cylindric, longitudinal ribbed and furrowed, bristles white, soft, 3x longer than the achene, 3.4-3.8 x 0.5-0.7 mm. Surface glabrous, some furrows scarce with white short bristles, lustreless, dark-brown.  $2n = 40$ .** Native to Europe, forest clearings, cut-over areas, sandbanks, boundaries, embankments and stony places. Hu, Pl, Ro, Sk, Uk.

**3636. *Senecio vulgaris*** L. — Annual, bare or thin-cobwebby, stems erect or ascendent, 10-50 cm high, ramified from below, finely grooved. **Fruits achenes, cylindric, tapered both above and below, longitudinal ribbed and furrowed, bristles white and lustrous, 3x longer than the achene, 2-2.5 x 0.5-0.6 mm. Surface dense, white hirsute, lustreless, pale- or reddish-brown.  $2n = 40$ .** Native to Eurasia, as weed of fields and gardens, boundaries, waste grounds and roads in all Carpathian regions.



**3637. *Ligularia dentata*** (A. Grey) Hara, *L. clivorum* Maxim. — Perennial, stems erect, 25-100 cm high, non-branched, bare, hirsute above, often purple. **Fruits achenes, cylindric, narrowed at both ends, longitudinal ribbed and furrowed, bristles reddish, longer than the achene, 8-10 x 1.8-2.2 mm. Surface glabrous, lustrous, dark-brown. 2n = 60.** Native to eastern Asia; sometimes grown as permanent ornamental plant in parks.

**3638. *Ligularia glauca*** (L.) A. Hoffm., *L. carpatica* (Schott; Nyman et Kotschy) Pojark. — Perennial, stem erect, 50-150 cm high, non-branched, bare. **Fruits achenes, cylindric with four ribs, bristles dirty-white, 1/5-1/2 of the achene, 6-8 x 1.5-1.9 mm. Surface glabrous, slight lustrous, brown. 2n = 60.** Native to Eurasia, overgrown rocks, steppe and mountain grasslands of montane and subalpine zones. Ro, Sk.

**3639. *Ligularia sibirica*** (L.) Cass., *Cineraria sibirica* (L.) L. — Perennial, stems erect, 30-150 cm high, non-branched, hollow, bare or scarcely tomentose. **Fruits achenes, cylindric, narrowed at both ends, longitudinal furrowed, whitish-yellow bristles as long as the achene, 8-10 x 1.9-2.1 mm. Surface smooth, lustrous, greyish or brownish, furrows brownish or black. 2n = 60.** Native to Eurasia, marshy and peaty meadows, lowland forests and coastal shrub-beries. Hu, Pl, Ro, Sk, Uk.

**3640. *Ligularia wilsoniana*** Green — Perennial, stems 100-150 cm high, ground leaves cordial-reniform, sharply dentate, stem leaves cordial-ovoidal, flowers yellow. **Fruits achenes, ± oblong-cylindric, apex with whitish bristles, 6.5-8 x 1.2-1.4 mm. Surface longitudinal furrowed, faint lustrous, dark-brown to black. 2n = 60.** Native to China; in the Carpathians rarely cultivated as an ornamental in parks.

**3641. *Calendula arvensis*** L. — Annual, very similar to *C. officinalis*, stem ramified from base, ascendent or procumbent, 15-40 cm high or long, densely leafed. **Fruits achenes, varying in shape, size, surface and colour (often dark-brown up to black) the same as in *C. officinalis* 4-20 x 2-10 mm. 2n = 36, 44.** Native to the Mediterranean; dragging into the Carpathian fallow fields, vineyards and rubbish heaps. Hu, Mo, Pl, Ro, Sk, Uk.

**3642. *Calendula officinalis*** L. — Annual to biennial, stinking expressively, softly pubescent, stem erect, 20-50 cm, richly ramified, leafed. **Fruits achenes,**

**crescent bended till circular, without crest, dorsal side of target achenes verrucose, non-winged, border achenes with narrow beak, scaphoid or 3-winged, 8-20 x 2-7 mm. Surface varying from smooth to thorny, whitish-yellow up to grey. 2n = 32, 48.** Species of unknown origin (perhaps the Mediterranean). Commonly cultivated as an ornamental plant in gardens.

**3643. *Dimorphotheca aurantiaca*** DC., *Calendula fluccida* Vent. — Annual to biennial, 20-30 cm high, leaves in basal rosette. **Fruits achenes, of two types: a – ellipsoid, lateral compressed, 7.5-9 x 5-6 mm. Surface reddish or yellowish-brown; b – cuneiform, with lateral prominences, 4-5 x 1.4-1.6 mm. Surface brown.** Native to south Africa; grown as a high decorative plant in town verdure, rare in warmer areas of the Carpathians.

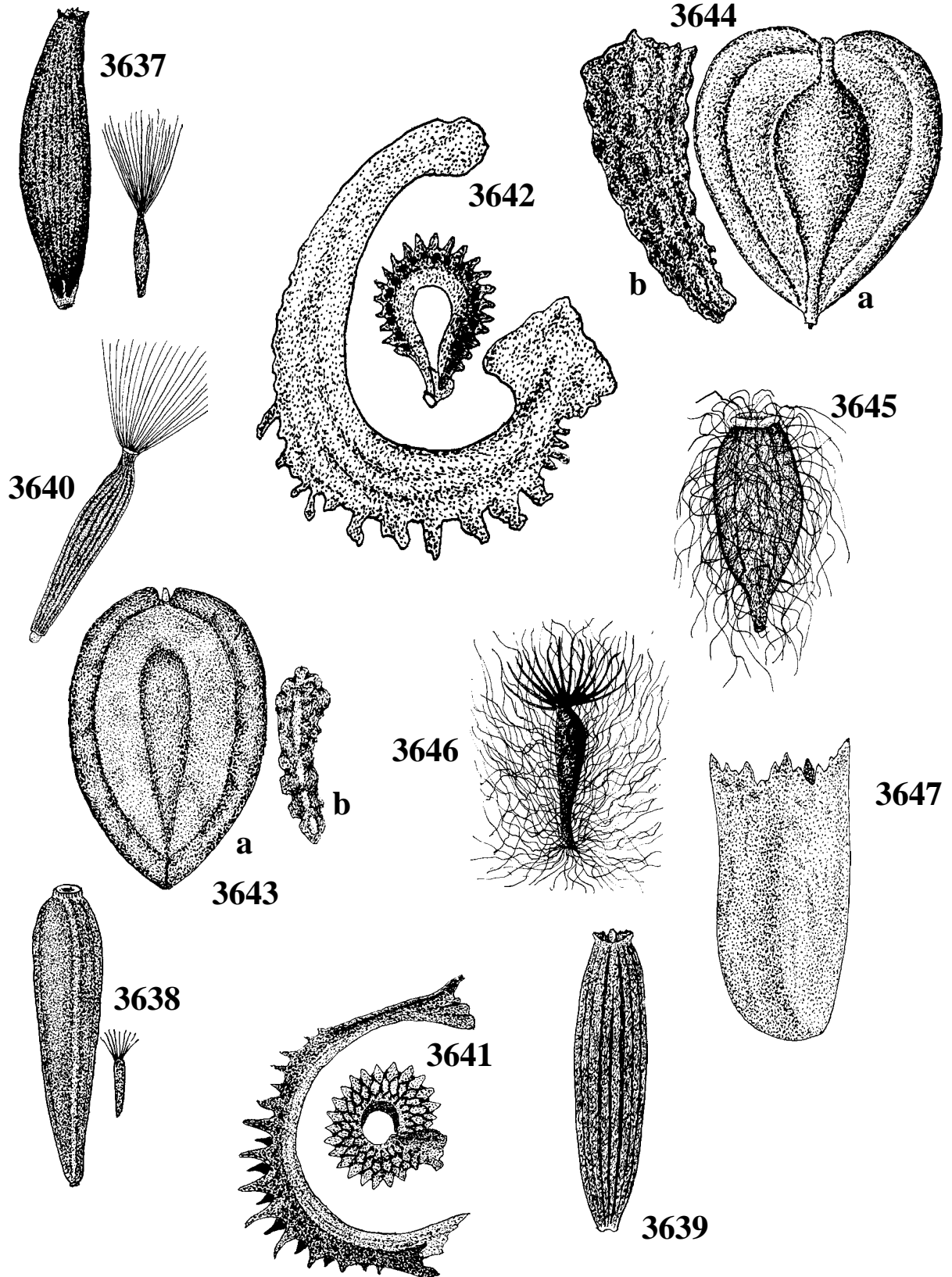
**3644. *Dimorphotheca pluvialis*** (L.) Moench, *Calendula pluvialis* L. — Annual, stems erect or procumbent, 20-40 cm high, branched, sparsely downy and glandular. **Fruits achenes, of two types: a – cordiform, 4-8 x 3-7 mm. Surface pale- to pinkish-brown; b – cuneiform, 4-6 x 1.5-2.2 mm. Surface pale- to dark-brown. 2n = 18.** Originally growing in south Africa; cultivated as an ornamental summer plant in gardens and town verdure.

**3645. *Arctotheca calendula*** (L.) Levyns, *Cryptosperma calendulacea* (Hill.) R. Br. — Annual, stem erect, without leaves or procumbent with leaves, up to 40 cm high. **Fruits achenes, cylindric, three ribs on dorsal side, two ribs on lateral side, apex with wreathlet, 3.3-3.7 x 1.3-1.6 mm. Surface wrinkly, black, felty, all covered with pinkish-yellow hairs. 2n = 18.** Originally growing in south Africa; rarely hauling into the Carpathians with wool and some plant material.

**3646. *Gazania rigens*** (L.) Gaertner, *G. splendens* hort. — Perennial, stems up to 50 cm high, decumbent, woody at base, leaves oblanceolate, entire. **Fruits achenes, oblong ± spindleform, with multiarticulated corona at apex, 4-5 x 0.8-1 mm. Surface dense sericeous, bristles yellowish, emerging from the whole surface, c. 6 mm long, corona brown.** Native to south Africa; in the Carpathians very rarely cultivated for ornament in warmer areas.

**3647. *Echinacea purpurea*** (L.) Moench, *Rudbeckia purpurea* L. — Perennial, stems 50-150 cm high, strong, poorly branched, leaves ovoid to ovoid-





lanceolate. **Fruits achenes, cylindric, lateral slight compressed, apex irregular dentate, bottom roundish, 4.2-4.8 x 1.8-2.2 mm. Surface slight longitudinal striate, smooth, dull, pinkish-brown.** Native to North America; in the Carpathians cultivated for ornament in parks and gardens. Mo, Uk.

**3648. *Carlina acanthifolia*** All., *C. utzka* Hacq. — Perennial, small plant, very similar to *C. acaulis*, stems very short, fitting to the leaves. **Fruits achenes, cylindric, deciduous crest, together with bristles, being c. 2 mm long, 8.5-9.5 x 1.8-2.2 mm. Surface dense covered with long adpressed bristles of orange colour in lower part, and greyish in upper part. 2n = 20.** Native to southern Europe, hay and holding out meadows, sunny hills. Ro.

**3649. *Carlina acaulis*** L. — Perennial, without stem or only a very short one, 3-5 cm, leaves in ground rosette. **Fruits achenes cylindric, narrowed below, with crest up to 13 mm long above, crest with feathery bristles, 4-5.5 x 1.4-1.6 mm (without crest). Surface dense hirsute with long bristles, slight lustrous, silverish. 2n = 20.** Native to Europe, dry, sunny meadows and pastures, waste places, boundaries. Br, Hu, Pl, Ro, Sk, Uk.

**3650. *Carlina biebersteinii*** Bernh. ex Hornem., *C. longifolia* Rchb. non Vies. — Biennial, stems simple, 30-70 cm high, little branched above, stem leaves oblong linear, cobwebby lanate beneath. **Fruits achenes, cylindric, apex truncate, with yellowish crest, bottom roundish, 3.4-3.8 x 0.9-1.1 mm. Surface adjacently dense hairy, slight lustrous, silverish.** Native to eastern Euro-Siberia, grassy slopes, forest clearings, pine woods. Br, Mo, Sk, Uk.

**3651. *Carlina intermedia*** Schur, *C. vulgaris* L. subsp. *intermedia* (Schur) Hayek — Biennial, stems 30-70 cm, crestly branched above, stem leaves lanceolate, densely felty up to downy on beneath. **Fruits achenes, cylindric, apex with white scales and yellowish crest, bottom narrowed, 3.4-3.8 x 0.9-1.1 mm. Surface adjacent dense hirsute, slight lustrous, silverish.** Native to Europe, shrubby and grassy slopes, deep river valleys with shallow and neutral soils. Hu, Ro.

**3652. *Carlina vulgaris*** L. — Biennial, bare, thinly cobwebbed, stem erect, 10-70 cm high, angular, simple, poorly ramified above. **Fruits achenes cylindric narrowed below, above with bristles up to 8 mm long, 3.2-4 x 0.9-1.1 mm (without crest).**

**Surface dense hirsute, silverish. 2n = 20.** Native to Euro-Siberia, sunny, stony or shrubby slopes, forest margins and cut-over areas, boundaries. Hu, Mo, Pl, Ro, Sk, Uk.

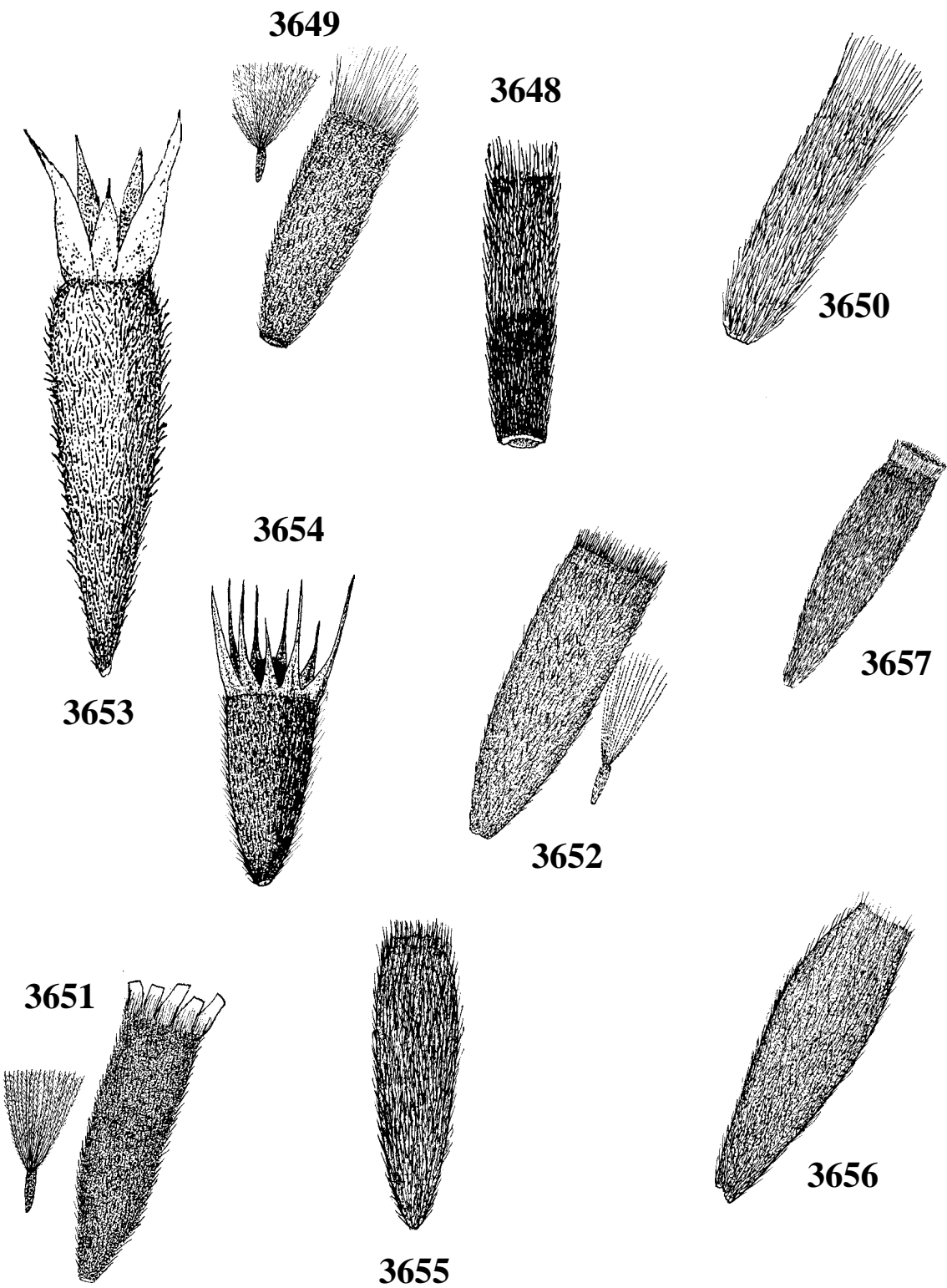
**3653. *Xeranthemum annuum*** L. — Annual, thinly greyish tomentose, stem erect, 20-50 cm high, ramified from below. **Fruits achenes, obconic, with crest emerging from five unequal membranous scales, 3.8-4.2 x 1.1-1.3 mm (without scales). Surface dense covered with long silverish hairs. 2n = 12.** Native to Eurasia, sunny steppes, grassy and stony slopes, vineyards, embankments and boundaries. Hu, Mo, Ro, Sk, Uk.

**3654. *Xeroloma cylindracea*** (Sibth. et Sm.) Holub, *Xeranthemum foetidum* Moench — Annual, stem erect, 15-80 cm long, angular, appressed hirsute, branched. **Fruits achenes, obconic, with crest emerging from 8-15 unequal membranous scales, 6-7 x 2.6-3 mm (without scales). Surface dense covered with long silverish hairs. 2n = 20.** Native to Eurasia, sunny stony and shrubby slopes, vineyards and karst steppes. Hu, Mo, Ro, Uk.

**3655. *Echinops banaticus*** Roch., *E. rochelianus* Griseb. — Perennial, stems erect, 50-120 cm high, simple or weakly branched, cobwebby lanate. **Fruits achenes, cylindric, apex truncate, bottom narrowed, 8-9 x 1.8-2.2 mm. Surface fully covered with long, pale-yellowish hairs.** Native to southern Europe, forest margins and shrubberies of uplands. Ro, Uk.

**3656. *Echinops exaltatus*** Schrad., *E. commutatus* Juratzka — Perennial, stem erect, 40-150 cm high, ramified, white-lanate above. **Fruits achenes, subcylindric, wide-spread in upper half, apex truncate, bottom narrowed, 10-12 x 2.8-3.2 mm. Surface fully covered with long pale-yellowish hairs. 2n = 30.** Native to southeastern Europe, shrubby and stony slopes, vineyards and sometimes in gardens (honey-bearing plant), rarely escaping. Pl, Ro, Sk, Uk.

**3657. *Echinops microcephalus*** Sibth. et Sm. — Perennial, stem erect, 40-60 cm high, bottom glabrescent, tomentose above, ramified. **Fruits achenes, cylindric or obconic, apex truncate, bottom narrowed, crest overlapped with long adjacent hairs, 9.6-10 x 2-2.5 mm. Surface fully covered with long, pale-yellowish hairs.** Native to southern Europe, fields, dry uplands, sunny slopes. Ro.



**3658. *Echinops ritro*** L., *E. ruthenicus* (Fisch.) M. Bieb. — Perennial, stems 20-60 cm high, ramified, white tomentose, seldom glabrous. **Fruits achenes, oblong-obconic, crest short and overlapped with long adjacent hairs, 9-11 x 1.3-1.5 mm. Surface fully covered with long, pale-yellowish hairs. 2n = 32.** Native to southern Europe; in the Carpathians mostly erect in gardens as a permanent (honey-bearing) plant. Hu, Mo, Ro, Sk, Uk.

**3659. *Echinops sphaerocephalus*** L., *E. multiflorus* Lam. — Perennial, stem erect, angular,  $\pm$  white lanate, glandular above, ramified. **Fruits achenes, cylindric or slight obconic, about 2 mm high crest closed up to 2/3 and outgrows with hairs, 9-10 x 2.2-2.6 mm. Surface fully covered with long pale-yellowish hairs. 2n = 32.** Native to Eurasia, shrubby and stony slopes, pastures, ditches, embankments, roads and vineyards; in all Carpathian regions.

**3660. *Arctium lappa*** L., *Lappa major* Gaertn., *L. officinalis* All. — Biennial, stem erect, 90-150 cm high, angular, richly ramified. **Fruits achenes, obconic, with 5 or 6 longitudinal ribs, apex truncate with deciduous bristles, 6-7 x 2.2-2.6 mm. Surface smooth or weekly waved, lustreless, pale-brown, transversal spots dark-brown. 2n = 32, 36.** Native to Eurasia, waste places, scrubs, fences and rubbish heaps. Hu, Mo, Pl, Ro, Sk, Uk.

**3661. *Arctium minus*** (Hill.) Bernh., *Lappa minor* Hill. — Biennial, stem erect, angular, 50-150 cm high, richly ramified, twigs deflected and downy. **Fruits achenes, cylindric, apex truncate with deciduous crest, bottom narrowed, 6-7 x 2.3-2.9 mm. Surface foveolate, ribbed, lustreless, pale-brown, spotted. 2n = 36.** Native to Europe, commonly found in ditches, rubbish heaps, boundaries, fences, coastal scrubs and waste places. Hu, Mo, Pl, Ro, Sk, Uk.

**3662. *Arctium nemorosum*** Lej., *A. vulgare* (Hill) Evans, *Lappa nemorosa* (Lej.) Koern. — Biennial, very robust, stem spreadingly ramified, 100-250 cm high, twigs archedly crooked. **Fruits achenes, cylindric, apex truncate with deciduous crest, bottom narrowed, 6-9 x 2.7-3.3 mm. Surface longitudinal ribbed, tuberculate, lustreless, dark-brown. 2n = 36.** Native to Europe, moist woods and shrubberies, coastal thickets, lowland forests and pastures. Hu, Mo, Pl, Ro, Sk, Uk.

**3663. *Arctium pubens*** Babingt., *A. artisticum* Rapaics — Biennial, stem 1-2.5 m high, ramified,

striate, twigs spread. **Fruits achenes, subcylindric, apex dilated with deciduous crest, bottom narrowed, carpellary hilum, 5-7 x 2.3-2.7 mm. Surface  $\pm$  glabrous, lustreless, dark-brown with blackish spots.** Native to Europe, ruderal places and forest margins. Ro.

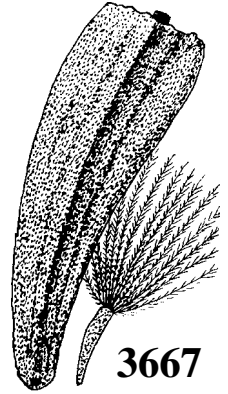
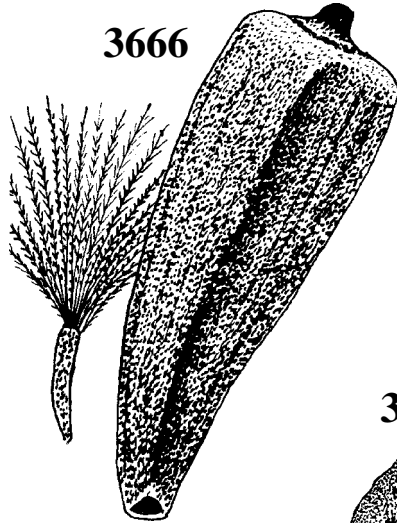
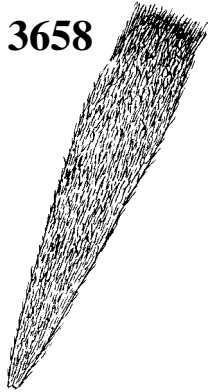
**3664. *Arctium tomentosum*** Mill., *Lappa tomentosa* (Mill.) Lam. — Biennial, stems ramified, erect, 50-150 cm high. **Fruits achenes, obconic, with 5 or 6 longitudinal ribs, apex truncate with deciduous crest, 5-6 x 2-2.5 mm. Surface glabrous, pale-brown, dark-brown spotted. 2n = 36.** Native to Eurasia, forest margins, shrubberies, roads, embankments, fences; in all Carpathian regions.

**3665. *Saussurea alpina*** (L.) DC., *Serratula alpina* L. — Perennial, stem erect, 5-40 cm high, simple, glabrous. **Fruits achenes, obconic, slight crooked, apex dilated and truncate, internal bristles 3x longer than the achene, ring-shaped adherent, feathery, indeciduous, outer bristles shorter, rough, deciduous, bottom narrowed with round hilum, 3-6 x 1.4-1.6 mm. Surface longitudinal shallow ribbed, dull or slight lustrous, yellowish-brown. 2n = 52, 54.** Native to Europe, stony and rocky slopes of subalpine and alpine zones. Pl, Ro, Sk, Uk.

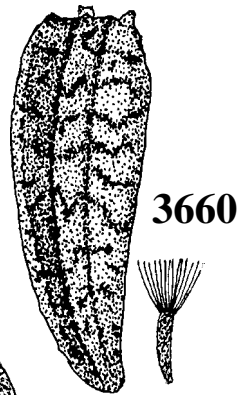
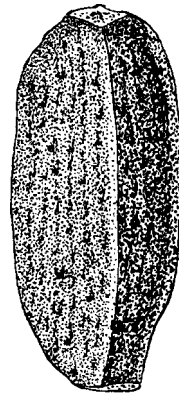
**3666. *Saussurea discolor*** (Willd.) DC., *Serratula discolor* Willd. — Perennial, stem erect, 5-30 cm, cobwebby lanate, twigs with single flower head. **Fruits achenes, obconic, slight crooked, apex dilated, internal bristles 2x longer than the achene, outer bristles 1/2 of internal, 4-5 x 1.4-1.6 mm. Surface fine ribbed, glabrous, lustreless, pale-brown. 2n = 26.** Native to Eurasia, sunny and stony mountain meadows, rocks, moist and calcareous grounds. Pl, Ro, Sk, Uk.

**3667. *Saussurea pygmaea*** (Jacq.) Spreng., *Cnicus pygmaeus* Jacq. — Perennial, stem erect, 5-25 cm high, unramified, with single flower head, white lanate. **Fruits achenes, obconic, little crooked, bottom narrowed, apex dilated and truncate with bristles, 5-6 x 1.4-1.6 mm. Surface longitudinal shallow ribbed, glabrous, lustreless, whitish-brown. 2n = 52.** Native to Europe, crumbled rocks, rock slits, stony meadows, moist, non-calcareous, stony grounds. Pl, Ro, Sk.

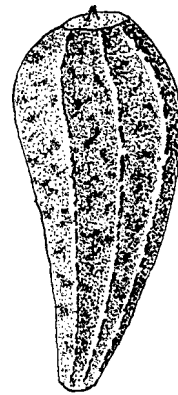
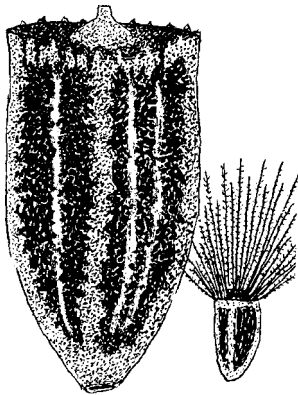
**3668. *Jurinea arachnoidea*** Bunge, *J. consanguinea* subsp. *arachnoidea* (Bunge) Kožuharov — Perennial, stem with single flower head, 30-70 cm high, lower



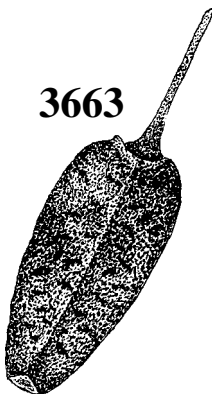
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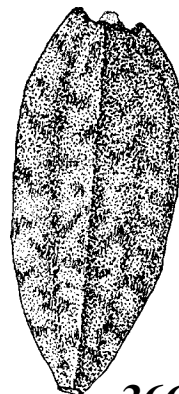
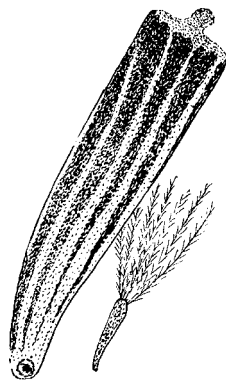
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3663



3665



part leafed. **Fruits achenes, cylindric or conic, quadrangular in outline, apex truncate, with white bristles of various length, bottom narrowed, 3.5-4 x 1.8-2 mm. Surface acute verrucose, lustreless, brown. 2n = 36.** Native to southern Europe, lawns, shrubs of lowland areas. Mo, Pl, Ro, Uk.

**3669. *Jurinea calcarea* Klokov, *J. ledebourii* Bunge** — Perennial, stems 40-80 cm high, finely sulcate, leafy towards base. **Fruits achenes, cuneiform, quadrangular, dentate apex with crest, bristles rough of various length, 3.6-4 x 1.8-2.1 mm. Surface tuberculate, puberulent, lustreless, dark-brown. 2n = 36.** Native to southeastern Europe, stony and steep slopes. Mo, Ro, Uk.

**3670. *Jurinea consanguinea* DC.** — Perennial, stems 20-35 cm high, leafy in the basal half, basal leaves c. half as long as the stem, shallow pinnatifid, subglabrous above, tomentose beneath. **Fruits achenes, obpyramidal, quadrangular, apex truncate with inconspicuous corona, bristles as long as the achene, 4-5 x 1.8-2.2 mm. Surface tuberculate, lustreless, pale and dark-brown.** Native to the mountains of the Balkan Peninsula. Ro.

**3671. *Jurinea cyanoides* (L.) Rchb.** — Perennial, stem erect, 20-60 cm high, ramified, angular, flower head 1-3. **Fruits achenes, obpyramidal, shallow longitudinal furrowed, apex truncate with bristles of various length, bottom narrowed, 5-6.5 x 2.8-3.2 mm. Surface glabrous, dull, yellowish-brown. 2n = 30.** Native to Eurasia, dry and sandy uplands. Br, Pl.

**3672. *Jurinea mollis* (L.) Rchb.** — Perennial, stems erect, 30-70 cm high, mostly unbranched, densely leafed below, without leaves above. **Fruits achenes, obpyramidal, quadrangular in outline, longitudinal ribbed, apex truncate with rest of the style, whitish crest with bristles as long as the achene, 3.5-4 x 2-2.5 mm. Surface wrinkly, tuberculate, lustreless, dark-brown. 2n = 34.** Native to Eurasia, sunny, grassy and stony slopes, karst steppes of warmer areas. Au, Hu, Ro, Sk.

**3673. *Jurinea stoechadifolia* (M. Bieb.) DC., *Serratula stoechadifolia* M. Bieb.** — Perennial, stems erect, 10-40 cm high, white tomentose, ramified above. **Fruits achenes, obpyramidal, longitudinal fine ribbed, apex truncate, bristles longer than the achene, 5.5-6.5 x 2.2-2.5 mm. Surface grooved, lustreless, upper part dark-brown, lower whitish.**

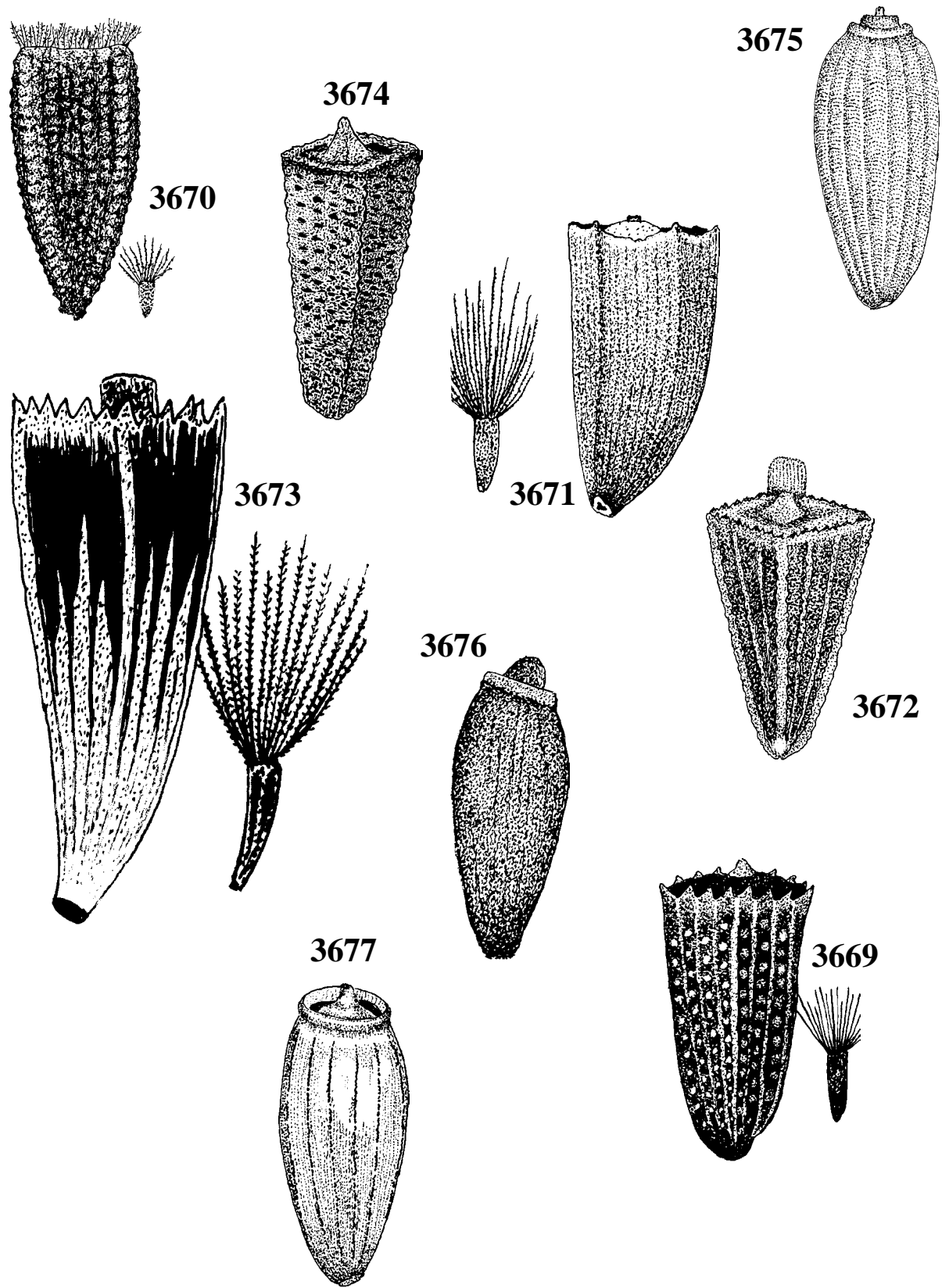
Native to southern Europe, arid lowlands, stony uplands and sunny slopes. Mo, Ro, Uk.

**3674. *Jurinea transsilvanica* Simk., *J. simonkiana* Nyár.** — Perennial, stem solitary, seldom more stems, 25-90 cm high, lower part leafed, with single capitulum. **Fruits achenes, quadrangular, obpyramidal, apex truncate, whitish crest 2x longer than the achene, bristles deciduous, 4-4.5 x 2-2.4 mm. Surface glabrous or granular, longitudinal ribbed, lustreless, dark-brown to black.** Endemic to Romania, hay-meadows, grassy uplands, sunny and stony slopes, lowland areas. Ro.

**3675. *Carduus acanthoides* L.** — Biennial, stems erect, 30-150 cm high, crispily pubescent, ramified in upper half, narrowly crispily winged up to capitulum. **Fruits achenes, prolonged obovoid, apex truncate with rest of the style and narrow corona, crest bristles adherent in the base, internal bristles longer than outer, simple (no feathery), length of outer bristles equal, crest 10-13 mm long, bottom narrowed, 2.8-3.8 x 1.1-1.4 mm. Surface longitudinal shallow furrowed, transversal wrinkly, slight lustrous, greyish or brownish. 2n = 16, 20, 22.** Native to Europe, pastures, boundaries, roads, rubbish heap, cut-over areas. Hu, Mo, Pl, Ro, Sk, Uk.

**3676. *Carduus collinus* Waldst. et Kit., *C. cylindricus* Borbás** — Biennial up to perennial, stem erect, 50-100 cm high, poorly ramified in upper half, lobedly and spinulously winged. **Fruits achenes, cylindric, apex truncate with narrow corona and rest of the style, crest 12-13 mm, 3-3.5 x 1.2-1.4 mm. Surface minute verrucose, mostly with uncomplete furrows, slight lustrous, greyish-brown. 2n = 16, 32.** Native to the Carpathians, karst and forest steppes, sunny pastures. Hu, Pl, Ro, Sk.

**3677. *Carduus crispus* L., *C. sepincola* Hausskn.** — Biennial, stem erect, 60-150 cm high, sparsely cobwebby hirsute, spiny-lobedly winged. **Fruits achenes, obconical, apex truncate with narrow corona and rest of the style, crest about 10 mm long, 3-3.5 x 1.3-1.5 mm. Surface longitudinal shallow furrowed, granular, greyish-brown. 2n = 16.** Native to Eurasia, coastal shrubberies, lowland woods, ditches, cut-over areas. Hu, Mo, Pl, Ro, Sk, Uk.



**3678. *Carduus glaucinus*** Holub, *C. glaucus* Baumg. non Cav., *C. defloratus* auct. non L. — Perennial, stem 20-70 cm high, erect or ascendent, mostly unramified, usually with 2 flower heads. **Fruits achenes, obconic, apex truncate with narrow corona and rest of the style, 4.1-4.5 x 1.5-1.8 mm. Surface longitudinal striate, slight lustrous, greyish-brown. 2n = 22.** Native to the Carpathians and the East Alps, calcareous stony slopes of the montane zone. Hu, Pl, Ro, Sk, Uk.

**3679. *Carduus hamulosus*** Ehrh., *C. pseudocollinus* (Schmalh.) Klokov — Biennial, stem erect, 30-100 cm high, simple, with some one capitula twigs, sparsely cobwebby hirsute. **Fruits achenes, obconic, slight crooked below, apex truncate with narrow corona, crest about 15 mm, 4-4.5 x 1.4-1.6 mm. Surface longitudinal shallow furrowed, minute verruculose, slight lustrous, greyish-brown.** Native to Europe, karst steppes and pastures, hay-meadows and grazing lands, sunny uplands, roadsides of lowland areas; in all Carpathian territories.

**3680. *Carduus kernerii*** Simk., *C. transsilvanicus* Kern. — Perennial, stems 20-80 cm high, poorly ramified in upper half, wide (up to 7 mm) winged, twigs unwinged. **Fruits achenes, cylindric or slight obconic, apex truncate with narrow corona, 4-5 x 1.6-1.8 mm. Surface smooth or very shallow longitudinal furrowed, transversal wrinkly, slight lustrous or lustreless, pale-brown.** Native to the East Carpathians and the Balkan Mountains, in subalpine and alpine zones on lawns, steep sunny slopes, calcareous underlay. Pl, Ro, Uk.

**3681. *Carduus nutans*** L., *C. leiophyllus* Petrović — Annual (biennial), stem erect, 30-150 cm high, poorly branched above, spinely crispily winged,  $\pm$  lanate, leaves pinnate. **Fruits achenes, obovoid, apex truncate with 15-20 mm long crest, bottom narrowed, 3.5-4 x 1.4-1.7 mm. Surface longitudinal shallow furrowed, transversal wrinkly, slight lustrous, brownish. 2n = 16.** Native to Europe, sunny, barren grounds, boundaries, pastures, karst steppes, often on stony and sandy soils. Au, Hu, Pl, Ro, Sk, Uk.

**3682. *Carduus personata*** (L.) Jacq, *Arctium personata* L. — Perennial, stems erect, 50-150 cm high, shortly branched above, sparsely cobwebby hirsute, lobedly winged. **Fruits achenes, obconic or obovoid, apex truncate with narrow corona and rest of the style, crest 8-12 mm long, 3.7-4.3 x 1.5-1.8 mm. Surface glabrous, longitudinal**

**shallow furrowed, slight lustrous, dark-grey. 2n = 18, 22.** Native to Europe, coastal shrubberies, river valleys, mountain meadows and moist woods. Pl, Ro, Sk, Uk.

**3683. *Carduus pycnocephalus*** L. — Annual, stems 70-100 cm high, arachnoid-hairy below, greyish-tomentose above, triangular, wings up to 5 mm wide. **Fruits achenes, cylindric, lateral compressed, apex truncate, with white crest, 2-3x longer than the achene, 4.2-5 x 1.5-1.7 mm. Surface smooth, fine longitudinal striate, lustrous, yellowish-grey. 2n = 62-64.** Native to southern and southeastern Europe, waste places. Uk.

**3684. *Carduus thoermeri*** Weinm. — Biennial, 30-60 cm high, flower heads 3-6 cm in diam, leaves at base bare. **Fruits achenes,  $\pm$  ellipsoid, apex truncate with crest, bristles 2x longer than the achene, 3-3.8 x 1.3-1.5 mm. Surface glabrous, longitudinal furrowed, faint lustrous, light-brown. 2n = 16.** Native to southern Europe (Pontic, Balkan), among ruderals. Mo, Ro, Uk.

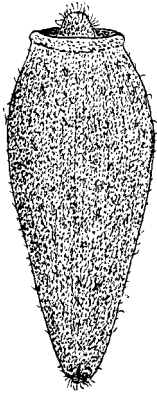
**3685. *Ptilostemon afer*** (Jacq.) Greuter, *Cnicus afer* Willd. — Usually biennial, stems 40-100 cm high, whitish-tomentose, subglabrous, leaves oblong-lanceolate, deeply 2- to 3-lobed. **Fruits achenes, obovoid, apex with crest long 15-20 mm, bottom gradually narrowed, with roundish hilum, 4-4.6 x 1.8-2 mm. Surface smooth, faint lustrous, with a few large longitudinal and many small spots, pale-greyish or pale-brownish.** Native to mountains of Balkan Peninsula, stony slopes and rocks, calcicole. Ro.

**3686. *Cirsium acaule*** Scop., *C. acaulon* (L.) Scop. — Perennial, stems very short (1 cm), rarely up to 20 cm, with one or two flower heads, unwinged. **Fruits achenes, obconic with rib in the dorsal and ventral sides, apex with low corona with conical protuberance in the middle, bristles feathery, whitish, long, 4.3-4.7 x 1.8-2 mm. Surface shallow striate, lustreless, dirty-white. 2n = 34.** Native to Europe, meadows, pastures, boundaries, forest margins and clearings. Br, Pl, Ro, Sk.

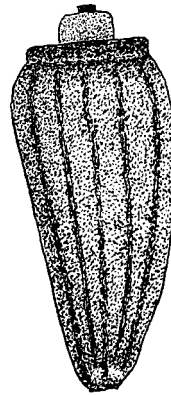
**3687. *Cirsium alatum*** (S. G. Gmelin) Bobrov, *C. setigerum* Ledeb. — Biennial, stems erect, rarely crooked, 25-80 cm high, bottom leafed, hirsute. **Fruits achenes, ellipsoid or subcylindric, with low corona at apex, crest white, 2.8-3.2 x 1.2-1.4 mm. Surface fine striate, slight lustrous, white-grey with small**



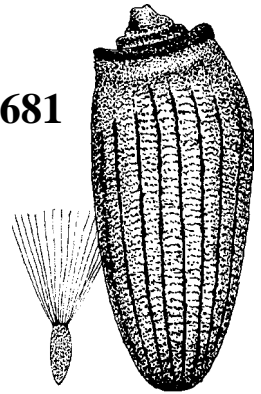
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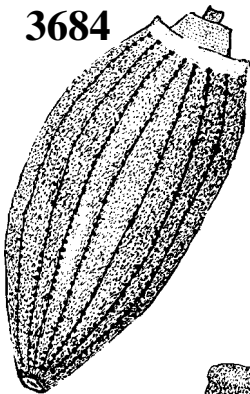
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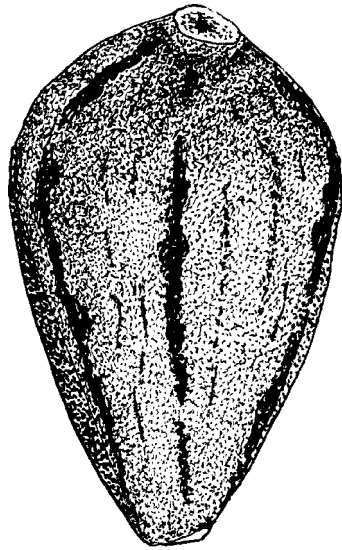
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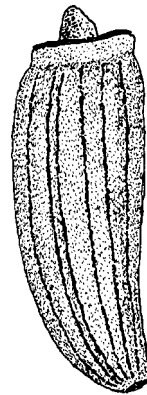
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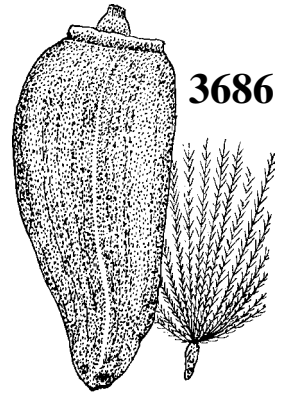
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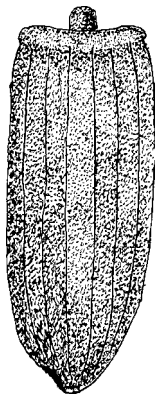
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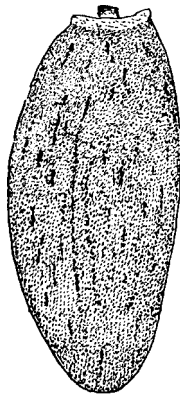
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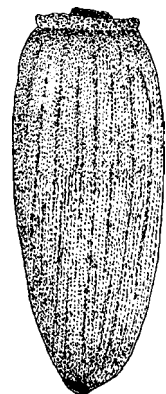
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**longitudinal spots.** Native to Siberia, rare or reinforced sandbanks of maritime areas. Mo, Ro, Uk.

**3688. *Cirsium arvense* (L.) Scop., *Carduus arvensis* (L.) Sm.** — Perennial, stems erect, 15-120 cm high, angularly furrowed, unwinged, leafed up to apex. **Fruits achenes, cylindric or slight conic, apex with low corona and conical protuberance in the middle, whitish crest about 20-30 mm long, 3-3.5 x 0.9-1.3 mm. Surface without any or only slight distinct ribs, fine striate, slight lustrous, pale-brown. 2n = 34.** Native to Eurasia, fields, cut-over areas, stony slopes, screes, waste grounds, rubbish heaps; in all Carpathian regions from lowland to montane zones.

**3689. *Cirsium brachycephalum* Jur., *C. pseudopalustre* Schur** — Biennial, stems erect, 80-110 cm high, ramified above, incoherently spinulously winged below. **Fruits achenes, obconic with only indistinct ribs, low corona above, crest about 7 mm, 2.5-2.8 x 1-1.2 mm. Surface minute verruculose, lustreless, yellowish- or greyish-white. 2n = 68.** Native to Pannonian swampy meadows. Hu, Ro, Sk.

**3690. *Cirsium x candolleianum* Gris., *C. spinosissimum* Schur** — Biennial, stems erect, 150-250 cm high, thick, hollow, glabrous, richly ramified. **Fruits achenes, cylindric, apex with low corona and conical protuberance in the middle, whitish crest about 15 mm, 3.8-4.2 x 1.6-1.9 mm. Surface glabrous, dull, whitish.** Native to the Balkan Peninsula stony and grassy slopes, shrubberies, forest margins and clearings. Ro.

**3691. *Cirsium canum* (L.) All., *C. serratuloides* Baumg.** — Perennial, stems erect, 50-150 cm high, unramified or with a few twigs with flower heads. **Fruits achenes, obconic with indistinct ribs, apex truncate with conical protuberance in the middle, yellowish crest about 15 mm long, 3.8-4.2 x 1.4-1.6 mm. Surface smooth or fine striate, slight lustrous, whitish-yellow. 2n = 34.** Native to Euro-Siberia, moist and swamp meadows, forest wetness, wet ditches, riverbanks of lowland and montane zones. Hu, Mo, Pl, Ro, Sk, Uk.

**3692. *Cirsium ciliatum* (Murr.) Moench.** — Biennial, stem erect, 60-120 cm high, strong, hirsute, ramified above. **Fruits achenes, ellipsoid or subcylindric with narrow corona above, whitish crest (20-26 mm), 3.8-4.3 x 1.4-1.6 mm. Surface indistinct shallow striate, without or with only indistinct ribs,**

**dull, whitish- or pale-brown.** Native to Eurasia, on ruderal and uncultivated areas. Mo, Ro, Uk.

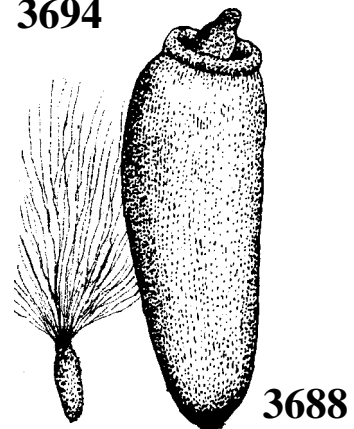
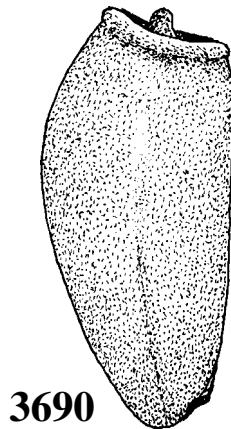
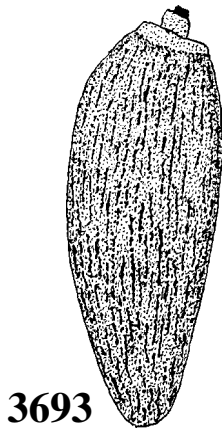
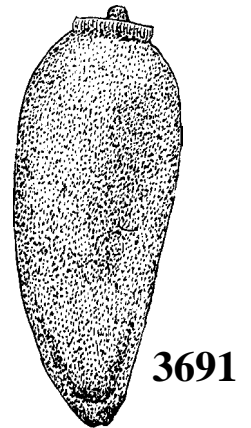
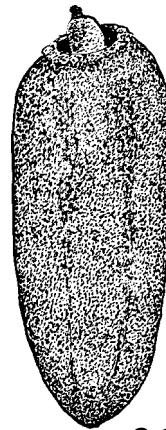
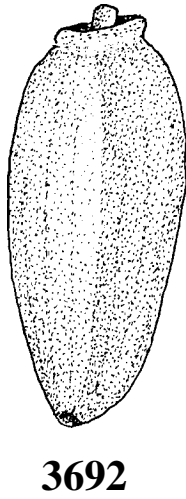
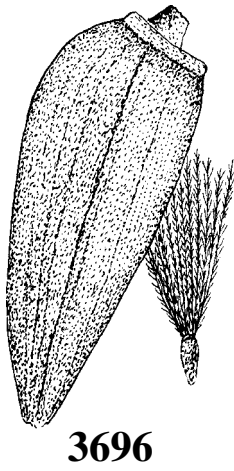
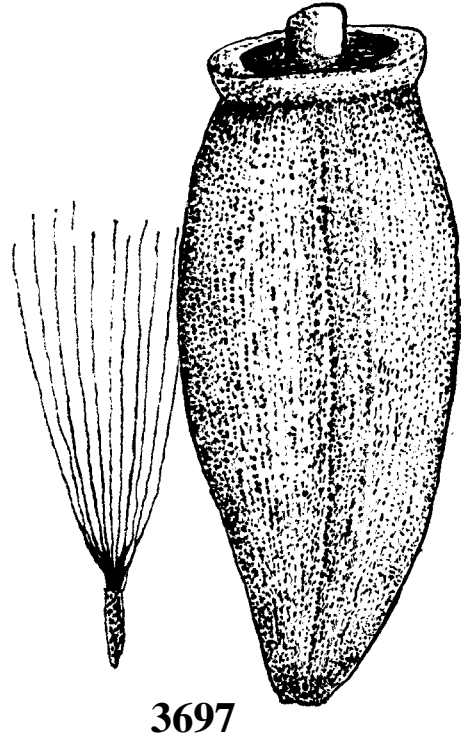
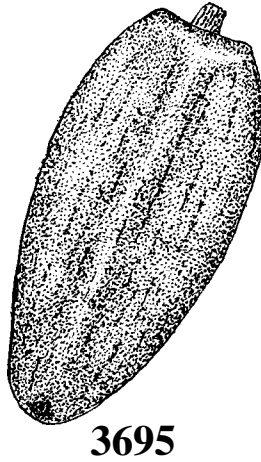
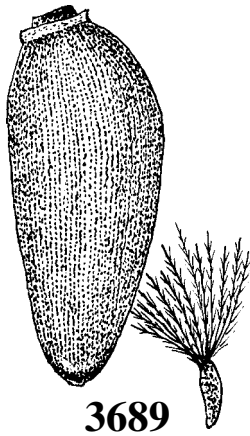
**3693. *Cirsium decussatum* Janka, *C. polonicum* (Petr.) Il'jin.** — Biennial, stems 60-130 cm high, erect, strong, angular, hirsute or tomentose, moderately branched. **Fruits achenes, ellipsoid, apex truncate with narrow corona and conical protuberance in the middle, crest 20-30 mm long, 5.3-6 x 2-2.5 mm. Surface glabrous, lustrous, greyish-brown with prolonged, thin brown spots.** Native to eastern Europe, light forest margins, stony and shrubby slopes. Pl, Ro, Sk, Uk.

**3694. *Cirsium echinus* (M. Bieb.) Hand.-Mazz., *C. scleranthum* M. Bieb.** — Biennial, stems erect, 40-60 cm high, non-winged, branched above, downy, richly leafy. **Fruits achenes, cylindric, apex aslant truncate with beak in the middle, bottom narrowed, blunt acute, 3.1-3.5 x 1.3-1.5 mm. Surface smooth, faintly lustrous, dirty-whitish to pale-brown.** Native to Asia Minor; rarely dragging into the Carpathians with agricultural commodities.

**3695. *Cirsium eriophorum* (L.) Scop., *Carduus eriophorus* L.** — Biennial, stem erect, 50-150 cm high, thick, branched, lanate, non-winged. **Fruits achenes, oval, slight flattish, apex truncate with conical protuberance in the middle, dirty white crest about 20 mm long, 5.5-6.5 x 2.8-3.2 mm. Surface glabrous or slight striate, lustrous, greyish-brown, along spotted brown. 2n = 34.** Native to Europe, sunny slopes, light shrubberies, forest margins, cut-over areas and pastures, along roads and railway-lines. Hu, Pl, Ro, Sk.

**3696. *Cirsium erisithales* (Jacq.) Scop., *Carduus erisithales* Jacq.** — Perennial, stems erect, 30-60 cm high, non-winged, ramified above, sticky lanate. **Fruits achenes, obconic, apex truncate with low corona, crest about 15 mm long, 4.3-5 x 1.8-2 mm. Surface shallow striate, smooth, lustreless, whitish or pinkish. 2n = 34.** Native to Europe, forest clearings, brookbanks, coastal shrubberies, mountain meadows of the montane zone. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**3697. *Cirsium heterophyllum* (L.) Hill, *C. helenioides* auct. non (L.) Hill.** — Perennial, stems erect, 80-150 cm high,  $\pm$  tomentose, simple or poorly ramified above, mostly with single capitulum. **Fruits achenes, obconic, apex with narrow collar and conical protuberance in the middle, whitish crest**



5-6x longer than the achene, 3.8-4.5 x 1.2-1.6 mm. Surface longitudinal faint striate, slight lustrous or dull, whitish-yellow or pale-violet.  $2n = 34$ . Native to Euro-Siberia, moist meadow and peats of mountain areas. Pl, Sk, Uk.

**3698. *Cirsium ligulare*** Boiss., *C. albidum* Velen. — Biennial, stems thick, strong, 1-2 m high, ramified, tomentose, angular. **Fruits achenes, cylindric or ellipsoid, apex with low corona and conical protuberance in the middle, crest 20-30 mm long, 5.4-5.8 x 2.4-2.6 mm. Surface glabrous, lustrous, whitish or pinkish with longitudinal narrow black spots.** Native to the Balkan Peninsula and Asia Minor, uncultivated or sunny grazing lands. Ro.

**3699. *Cirsium oleraceum*** (L.) Scop., *Cnicus oleraceus* L. — Perennial, stems erect, 50-150 cm high, poorly ramified above, hollow, shallow grooved, bare or weakly downy. **Fruits achenes obconic, truncate with low corona and conical protuberance in the middle, crest whitish, 15-20 mm long, 4.8-5.5 x 1.5-1.7 mm. Surface glabrous or slight striate, lustreless, whitish.  $2n = 34$ .** Native to Euro-Siberia, moist meadows, water banks, lowland forests, lawns, marshes, very common. Hu, Mo, Pl, Ro, Sk, Uk.

**3700. *Cirsium palustre*** (L.) Scop., *Carduus palustris* L. — Biennial, stems winged, slender, erect, 50-200 cm high, simple, poorly ramified above half. **Fruits achenes, obconic, mostly with indistinct ribs, apex with low corona, whitish crest 8-12 mm long, 3.5-4 x 1.2-1.4 mm. Surface shallow striate, lustreless, whitish.  $2n = 34$ .** Native to Euro-Siberia, moist meadows and pastures, lowland forests, peats and dry swamps, springheads, riverbanks, ditches, in the whole Carpathians.

**3701. *Cirsium pannonicum*** (L. fil.) Link, *Carduus pannonicus* L. fil. — Perennial, stems erect, 40-120 cm high, simple or with 1-3 unleafed flower head twigs. **Fruits achenes, coniform, ribs indistinct, apex truncate with low corona and conical protuberance in the middle, whitish-yellow crest 10-15 mm long, 3.8-4.2 x 1.7-1.9 mm. Surface shallow striate, dull or slight lustrous, whitish-yellow.  $2n = 34$ .** Native to Europe, moist up to drying out forest steppes and steppes meadows. Hu, Mo, Pl, Ro, Sk, Uk.

**3702. *Cirsium rivulare*** (Jacq.) All., *C. salisburgense* (Willd.) G. Don — Perennial, stems erect, 40-100 cm high, simple or poorly branched, leafed only below. **Fruits achenes, obconic, little crooked, apex trun-**

**cate with narrow corona, crest 15-20 mm long, 3.8-4.3 x 1.3-1.5 mm. Surface fine striate with four ribs, lustreless, yellowish-white.  $2n = 34$ .** Native to Europe, moist and salty meadows, ditches, along rivers, peats, from lowland to montane zones. Hu, Pl, Ro, Sk, Uk.

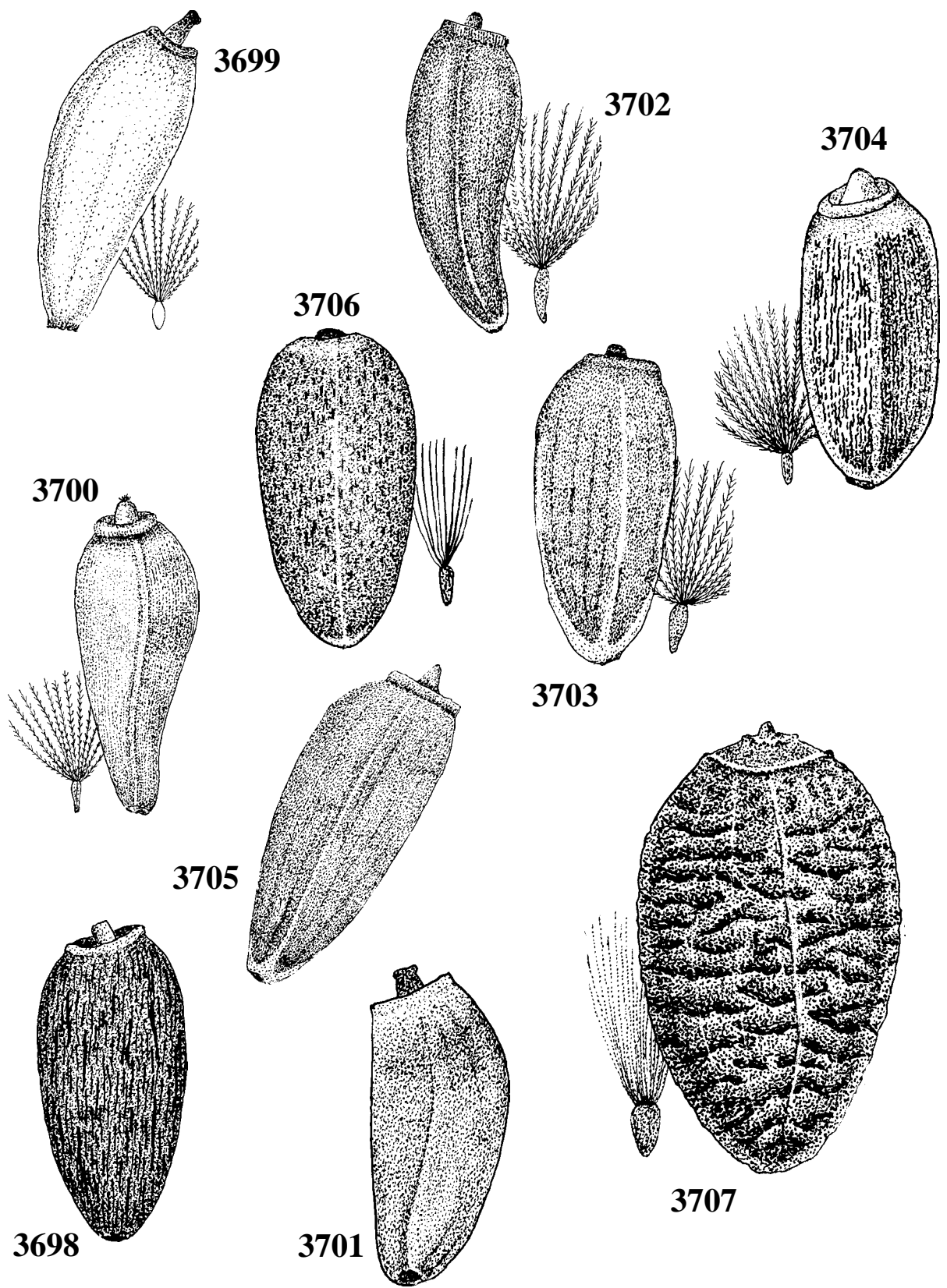
**3703. *Cirsium tuberosum*** (L.) All., *C. bulbosum* DC. — Perennial, stems erect, 50-150 cm high, simple or with few long twigs, non-winged, grooved. **Fruits achenes, ellipsoid, apex with weakly distinct slight corona, dirty white crest about 15 mm long, bottom with paler ribs, 4.3-4.8 x 1.8-2.2 mm. Surface dense striate, slight lustrous, greyish.  $2n = 34$ .** Native to western Europe; rarely hauling into Carpathian lawns and fertile soils. Ro.

**3704. *Cirsium vulgare*** (Savi) Ten., *C. lanceolatum* (L.) Scop. non Hill — Biennial, stem erect, 50-120 cm high, thin cobwebby lanate, branched in the upper half. **Fruits achenes, ellipsoid, with four indistinct ribs, apex truncate with narrow corona, crest 20-30 mm long, 2.8-3.2 x 1.1-1.4 mm. Surface fine striate, greyish with longitudinal dark-brown to black-spotted.  $2n = 68, 102$ .** Native to Eurasia, moist and light woods, coastal shrubs, pastures and shrubby slopes. Hu, Mo, Pl, Ro, Sk, Uk.

**3705. *Cirsium waldsteinii*** Rouy, *C. pauciflorum* (Waldst. et Kit.) Spreng. non Lam. — Perennial, stems erect, 50-150 cm high, cobwebby lanate, non- or poorly ramified, grooved. **Fruits achenes, obconic, without or only with faint distinct ribs, apex with low corona and conical protuberance in the middle, whitish crest 15-20 mm long, bottom narrowed, 5-6 x 1.7-1.9 mm. Surface smooth or fine striate, lustreless, whitish or violetish-yellow.  $2n = 68$ .** Native to the Alps and the Carpathians, mountain meadows, moist forest clearings, grassy and stony slopes, along rivers of the subalpine zone. Pl, Ro, Sk, Uk.

**3706. *Picnomon acarna*** Cass., *Carduus acarna* L. — Annual, stem erect, whole plant white tomentose, 20-60 cm high, richly ramified, broadly and prickly winged. **Fruits achenes, obconic, crest on apex 3x as long as the achene, 5-5.5 x 2.4-2.6 mm. Surface glabrous, lustrous, whitish-yellow to brown, oblong spotted.** Native to the Mediterranean, sunny ruderal places. Ro, Uk.

**3707. *Onopordum acanthium*** L. — Biennial, stems thick, erect, 50-200 cm high or richly ramified, winged, leafed. **Fruits achenes, ellipsoid, angular**



with four indistinct ribs, apex rounded with indistinct corona and conical protuberance in the middle, reddish crest 7-10 mm long, bristles rough, adherent on the base, 4.5-5 x 2.6-3 mm. Surface transversal rugose, slight lustrous, pale- or dark-grey.  $2n = 34$ . Native to Eurasia, roads, embankments, stone-pits, waste places, pastures, rural areas from lowland to montane zones. Hu, Mo, Pl, Ro, Sk, Uk.

**3708. *Onopordum tauricum*** Willd. — Biennial, stems 1-2 m high, erect, ramified, spines winged. **Fruits achenes, adpressed, ellipsoid or cylindric, apex truncate with conical protuberance in the middle, crest on apex, 5-5.6 x 2.8-3.2 mm. Surface transversal undulate, lustreless, pale- or dark-brown.** Native to Balkan Peninsula and the Crimea, uncultivated areas. Ro, Uk.

**3709. *Silybum marianum*** (L.) P. Gaertn., *Carduus marianus* L. — Annual to biennial, stems thick, erect, 50-150 cm high, lustrous, non-winged, lower stems densely above, scarcely leafed, with single capitulum. **Fruits achenes, obconic, apex truncate, with yellowish collarlet and yellowish about 15-20 mm long crest, bristles rough, adherent on the base, 6.5-7.5 x 3.6-4 mm. Surface glabrous, dull, greyish, brownish to blackish with darker spots.  $2n = 34$ .** Native to the Mediterranean, waste places, along roads, rural areas; in the Carpathians often cultivated as a decorative and medicinal plant in gardens.

**3710. *Serratula lycopifolia*** (Vill.) A. Kern., *Klasea lycopifolia* (Vill.) Á. et D. Löve, *S. nitida* (Waldst. et Kit.) Besser — Perennial, stems erect, 30-120 cm high, unramified, with single flower head. **Fruits achenes, slight compressed and obconic, apex truncate, yellowish crest 2x longer than the achene, bristles free, unhurt on the base, rough, bottom rounded, 4.7-5.2 x 1.9-2.1 mm. Surface longitudinal ribbed and furrowed, fine verrucose, lustreless, dark-brown to black.  $2n = 60$ .** Native to Eurasia, woodsteppes, sunny and shrubby uplands and moorland meadows. Hu, Mo, Pl, Ro, Sk.

**3711. *Serratula radiata*** (Waldst. et Kit.) M. Bieb. — Perennial, stems thin, erect, 40-80 cm high, scarcely hirsute, angular, ramified above. **Fruits achenes, cylindric or obconic, apex truncate with conical protuberance in the middle, apex bristles free, unhurt on the base, bottom narrowed, 4.7-5.2 x 1.6-1.8 mm. Surface longitudinal ribbed, smooth, dull, yellowish, brown, dark-brown to black.**

$2n = 30$ . Native to Eurasia, steppes, shrubby and grassy slopes. Hu, Mo, Ro, Uk.

**3712. *Serratula thracica*** Janka, *Centaurea thracica* (Janka) Hayek — Perennial, stems up to 50 cm high, simple or sparingly branched, leaves runcinate-lyrate, with few triangular lobes. **Fruits achenes,  $\pm$  spindle-form, lateral slight compressed, crest as long as or slight longer than the achene, 4.8-5.2 x 2.8-3.2 mm. Surface smooth, dull, pale-brown, fine longitudinal striate.** Native to the eastern part of the Balkan Peninsula and southeastern Romania, cut-over areas, wood clearings, stony and rocky places. Ro.

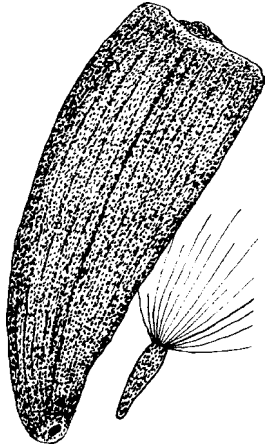
**3713. *Serratula tinctoria*** L. — Perennial, stems erect, 20-100 cm high, bare or downy, ramified above. **Fruits achenes, prolonged obovoid or lanceolate, ribs on both sides, apex with conical protuberance in the middle, crest dirty-white, 4-5 x 1.3-1.5 mm. Surface glabrous, longitudinal striate, dull, brown.  $2n = 22$ .** Native to Europe, light woods, sunny slopes, shrubberies, swampy and saline meadows. Hu, Mo, Pl, Ro, Sk, Uk.

**3714. *Serratula wolffii*** Andrae, *C. coronata* L. — Perennial, stems erect, 80-150 cm high, thick, glabrous, angularly striate, ramified above. **Fruits achenes,  $\pm$  cylindric, apex truncate with yellowish 9-10 mm long crest, bottom narrowed, 6-7 x 1.7-1.9 mm. Surface longitudinal ribbed, glabrous, dull, yellowish-brown.** Native to Euro-Siberia, haymeadows, shrubberies of the lowland zone. Mo, Ro.

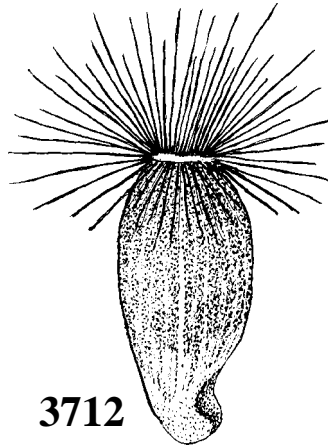
**3715. *Cynara scolymus*** L., *C. cardunculus* L. subsp. *scolymus* (L.) Hayek — Perennial, stem 1-2 m high, bare, leaves in ground rosette. **Fruits achenes, obconic, biconvex, dorsal and ventral sides with slight distinct ribs, apex with conical protuberance in the middle, 8-9 x 3.5-4.5 mm. Surface glabrous or fine longitudinal striate, dull, whitish-brown and poorly dark-brown spotted.** Native to Europe, probably to the Mediterranean; in the Carpathians very rarely cultivated as a vegetable.

**3716. *Amberboa moschata*** (L.) Lees., *Centaurea moschata* L. — Annual to biennial, bare, stems ramified, 30-70 cm high, glabrous or pubescent, with single flower head. **Fruits achenes, prolonged cylindric, flattish, apex truncate, crest balance, combined from indeciduous scurfs shoter than achene, crest yellowish, bottom with large hilum, 4.5-5 x 1.1-1.4 mm. Surface longitudinal ribbed and furrowed, dense hirsute, dull, blackish.** Native to

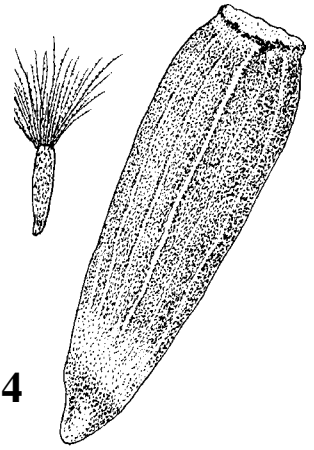
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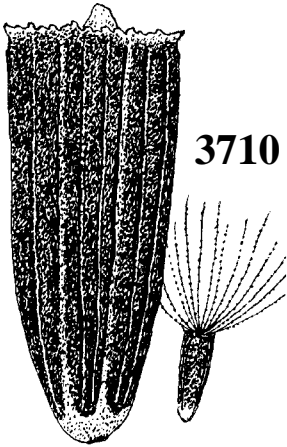
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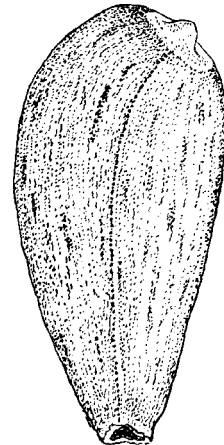
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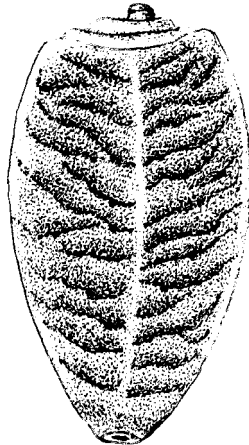
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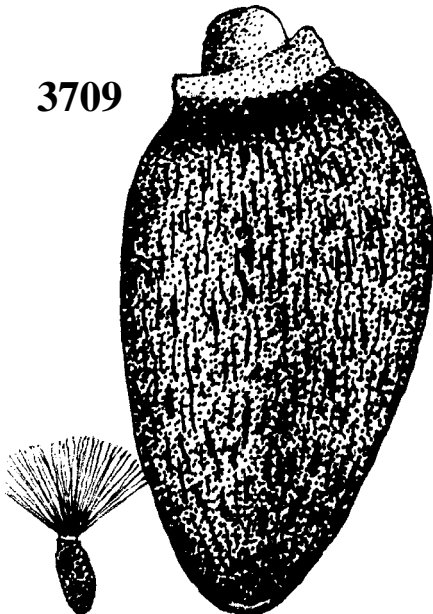
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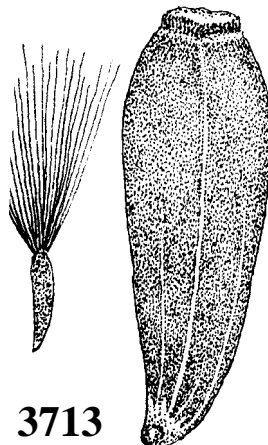
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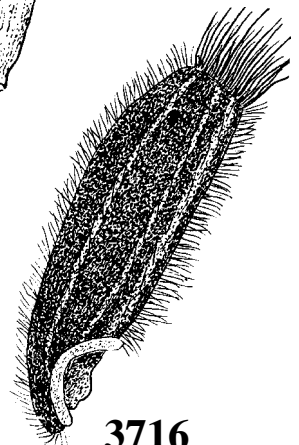
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eastern Asia; in the Carpathians often cultivated as an ornamental in gardens and parks, rarely escaping.

**3717. *Mantiscalca salmantica* (L.) Briq., *Centaurea salmantica* L.** — Biennial to perennial, bare below, young plant cobwebby lanate, stem erect, 30-100 cm high, ramified. **Fruits achenes, cylindric or slight conic with 10-15 ribs, finely compressed, crest from 2 rows of brownish scales, 3.8-4.2 x 1.3-1.5 mm. Surface transversal wrinkly, lustreless, yellowish-to blackish.  $2n = 18, 20, 22$ .** Native to the Mediterranean; hauling into the Carpathians on waste places and rubbish heaps.

**3718. *Acroptilon repens* (L.) DC., *A. picris* (Pall. ex Willd.) Cass., *Centaurea repens* L.** — Perennial, stems erect, 15-70 cm high, ramified, ribbed. **Fruits achenes, obovoid, crest 2x longer than the achene, 2.7-3.2 x 1.7-1.9 mm. Surface longitudinal striate, glabrous, slight lustrous, whitish-yellow.  $2n = 26$ .** Originally growing in western and central Asia; rarely hauling into the Carpathians, railway stations, embankments and fields.

**3719. *Colymbada alpestris* (Hegetschw.) Rauschert, *Centaurea alpestris* Hegetschw.** — Perennial, stems erect, 30-50 cm high, simple or poorly branched. **Fruits achenes, cylindric, apex truncate with low corona, crest about 4 mm long, 5.5-6 x 2-2.2 mm. Surface glabrous, slight lustrous, dark-brown.  $2n = 20$ .** Native to Europe, mountain meadows, dwarf pine, moist, stony and calcareous grounds. Pl, Sk, Uk.

**3720. *Colymbada badensis* (Tratt.) Dostál, *Centaurea badensis* Tratt.** — Perennial, stems 60-100 cm high, simple or poorly ramified, bare. **Fruits achenes, cylindric or obconic, apex truncate, brown crest as long as the achene or shorter, 4-5 x 1.6-1.8 mm. Surface smooth, slight lustrous, dirty-white, oblong spotted.** Pannonian endemic, on calcite and sunny overgrown rocks. Sk.

**3721. *Colymbada sadleriana* (Janka) Holub, *Centaurea sadleriana* Janka** — Perennial, stems erect, 60-120 cm high, angular, scabrous, ramified. **Fruits achenes, obconic, apex truncate, whitish or brownish, crest as long as the achene, bottom narrowed with hilum, 4.7-5.3 x 1.8-2.2 mm. Surface glabrous, soft hirsute, lustrous, pale- or dark-brown, sometimes with darker spots.  $2n = 20$ .** Native endemic to Pannonia, sunny stony slopes and light shrubberies. Hu, Ro, Sk.

**3722. *Colymbada scabiosa* (L.) Holub, *Centaurea scabiosa* L.** — Perennial, stems erect, 30-200 cm high, ramified, angular, leafy. **Fruits achenes, cylindric, apex truncate with narrow corona, yellowish-brown crest as long as the achene, with hilum below, 4.5-5 x 2-2.2 mm. Surface smooth or fine striate, slight lustrous, pale-brown.  $2n = 20$ .** Native to Euro-Siberia, sunny, stony, grassy and shrubby slopes, forest steppes, secondary in boundaries, fallows, fields and waste places. Au, Hu, Mo, Pl, Ro, Sk, Uk.

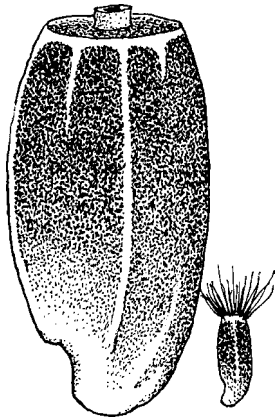
**3723. *Acosta arenaria* (M. Bieb.) Soják, *Centaurea arenaria* M. Bieb.** — Biennial or perennial, stems erect, 30-120 cm high, lower half richly ramified. **Fruits achenes, cylindric, apex truncate, crest white, 2-2.5 cm long, 3.4-3.8 x 1.5-1.7 mm. Surface wrinkly, slight lustrous, blackish, each side with one or two white stripes.** Native to European sandbanks. Hu, Mo, Ro.

**3724. *Acosta biebersteinii* (DC.) Dostál, *Centaurea biebersteinii* DC.** — Biennial, stems erect, 20-70 cm high, richly broomly ramified, lower twigs long, upper short and branched. **Fruits achenes, subcylindric, apex truncate with white plumose crest about 1/3 of the achene, 2.8-3.2 x 1.1-1.3 mm. Surface glabrous, fine striate, scarce hirsute, slight lustrous, whitish or greenish-grey.  $2n = 36$ .** Native to Europe, sunny, stony slopes and hills. Hu, Mo, Sk.

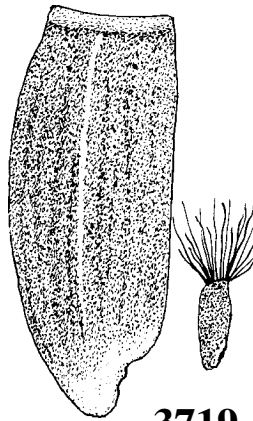
**3725. *Acosta diffusa* (Lam.) Soják, *Centaurea diffusa* Lam.** — Annual to biennial, stems erect, 20-50 cm high, richly branched, densely leafed. **Fruits achenes, elliptic, apex truncate, whitish crest very short (one mm) or strongly rudimental, 2.5-3 x 1.1-1.3 mm. Surface smooth, slight lustrous, greyish with few pale stripes.  $2n = 18$ .** Native to southeastern Europe; often hauling into the Carpathians, waste places, boundaries, dumps and fallows. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**3726. *Acosta rhenana* (Boreau) Soják, *Centaurea rhenana* Boreau, *C. stoebe* L.** — Biennial, stems erect, 30-100 cm high, above half ramified. **Fruits achenes, cylindric, apex truncate, white crest 1.5-2 mm long, bottom with large hilum, 2.5-3 x 1.2-1.4 mm. Surface glabrous, lustrous, dark-greenish to black with some few yellowish stripes.  $2n = 18$ .** Native to Europe, sunny and stony slopes, overgrown rocks, stone-pits, boundaries and fallows, embankments, waste grounds. Au, Br, Hu, Pl, Ro, Sk, Uk.

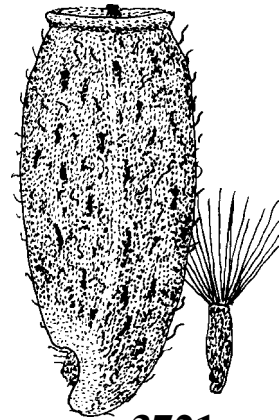




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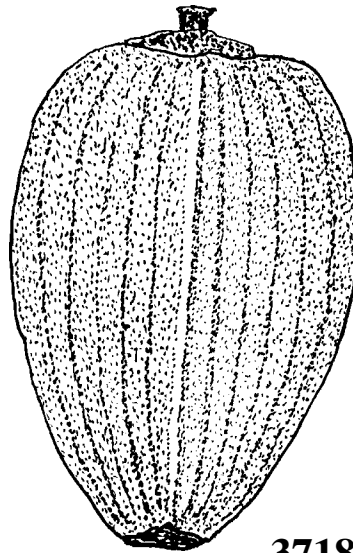
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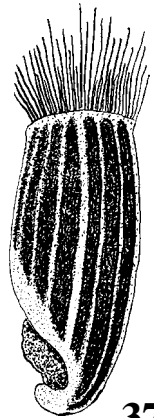
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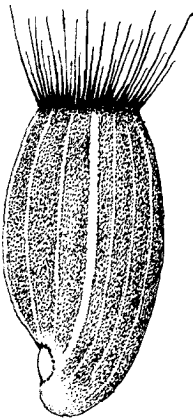
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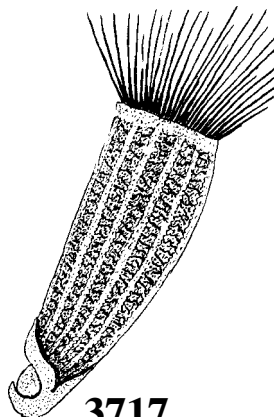
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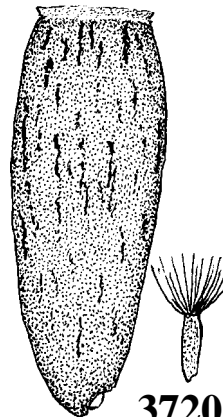
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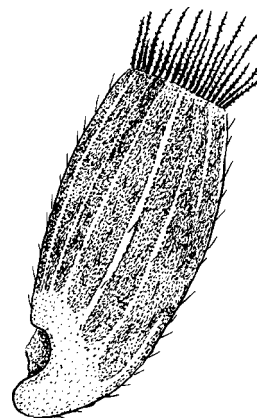
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**3727. *Calcitrapa iberica*** Schur, *Centaurea iberica* Trev. ex Sprengel, *C. calcitrapoides* Borbás – Biennial, stems erect or ascending, 40-80 cm high, divaricately branched in lower half, florets deep purple, glandular. **Fruits achenes, subcylindric, lateral compressed, apex truncate, crest 2-2.5 mm long, whitish, 3.8-4.2 x 1.6-1.8 mm. Surface smooth, lustreless, whitish pale-greyish, clear or with some pale-brown spots. 2n = 18.** Native to southeastern Europe and Asia Minor, uncultivated soils, ruderal places, sandbanks, roadsides and orchards. Mo, Ro, Uk.

**3728. *Calcitrapa solstitialis*** (L.) Lam., *Centaurea solstitialis* L. – Annual to biennial, stems erect or ascendent, 20-100 cm high, ramified, greyish felty, winged. **Fruits achenes, obconic, apex truncate with plane protuberance in the middle, crest rudimental or absent, bottom strong narrowed from one side, 2.1-2.6 x 1.2-1.4 mm. Surface glabrous, lustreless, base mostly greyish, rich spotted, black. 2n = 16.** Originally growing in southeastern Europe and southwestern Asia, hauling into the Carpathians on calcite rocky slopes and hills, embankments, boundaries, fallows and waste places.

**3729. *Calcitrapa stellaris*** Hill, *C. stellata* Lam., *Centaurea calcitrapa* L. – Biennial, stems ascending or erect, crisply downy, 20-100 cm high, ramified from bottom, angular. **Fruits achenes, ellipsoid, apex truncate with low conical protuberance in the middle, crest absent or very rudimental, 3.7-4.3 x 2-2.4 mm. Surface smooth, lustreless, white or whitish, sometimes with brown spots. 2n = 20.** Native to southeastern Europe and Asia Minor; often hauling into the Carpathians on boundaries, pastures, rubbish heaps and embankments.

**3730. *Jacea banatica*** Rochel, *Centaurea banatica* Rochel – Perennial, stems erect, ascendent, 60-150 cm high, angular, glabrous or tomentose, ramified, twigs simple. **Fruits achenes, cylindric or obconic, apex truncate, crest rudimental or absent, 3-3.4 x 1.4-1.6 mm. Surface scarce pubescent, lustreless, greyish.** Native to southeastern Europe, cultivated grounds, along roads and at ditch margins. Hu, Ro.

**3731. *Jacea carpatica*** (Porc.) Dostál, *Centaurea carpatica* (Porc.) Porc. – Perennial, stems erect, 50-120 cm high, angular, simple or moderately branched above, strongly roughened under the capitulum. **Fruits achenes, cylindric, apex truncate,**

**yellowish crest about 1-1.5 mm long, rudimental or absent, 3.3-3.7 x 1.4-1.6 mm. Surface faint striate, lustreless, grey. 2n = 44.** Native to central Europe, calcareous mountain meadows. Ro, Uk.

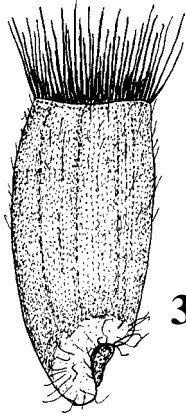
**3732. *Jacea indurata*** (Janka) Soják, *Centaurea indurata* Janka – Perennial, stems 50-100 cm high, erect, sparingly branched, leaves broadly lanceolate, florets pinkish-orange or purple. **Fruits achenes, oblong barrel-shaped, lateral slight compressed, apex truncate, crest very short, 3.3-3.7 x 1.6-1.8 mm. Surface longitudinal fine striate and ribbed, smooth, faint lustrous, pale-greyish or brownish.** Native to Pannonia and eastern Europe, sunny hills, shrubby slopes and forest steppes. Hu, Ro, Sk.

**3733. *Jacea macroptilon*** (Borbás) Soják, *Centaurea macroptilon* Borbás – Perennial, stems 60-80 cm high, erect, branched above, the branches thickened below the capitulum, lower leaves ovate-lanceolate, flowers pink. **Fruits achenes, cylindric, lateral slight compressed, crest absent or very short, 3-3.6 x 1.3-1.6 mm. Surface shallow striate, scarce hirsute, slight lustrous, greyish or brownish.** Native to southcentral Europe; grassy and shrubby slopes, boundaries. Hu, Sk.

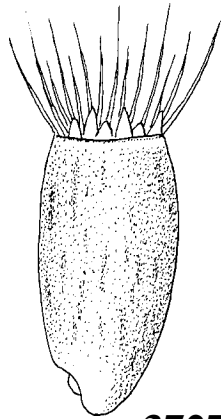
**3734. *Jacea macroptilon*** (Borbás) Soják subsp. *oxylepis* (Wimm. et Grab.) Dostál, *J. oxylepis* (Wimm. et Grab.) Dostál – Perennial, stems erect, 60-80 cm high, ramified above, roughened under flower heads. **Fruits achenes, cylindric, with conical protuberance in the middle, crest very short or absent, large hilum below, 3.5-3.8 x 1.3-1.5 mm. Surface faint striate, scarce softly hirsute, slight lustrous, greyish or brownish. 2n = 44.** Native to central Europe, grassy and shrubby slopes, boundaries. Hu, Pl, Ro, Sk.

**3735. *Jacea nemoralis*** (Jordan) Dostál, *Centaurea pratensis* Thull. – Perennial, stems erect, sometimes ascendent, 20-80 cm high, above half ramified. **Fruits achenes, ellipsoid, with conical protuberance in the middle, crest very short or absent, 2.6-3 x 1.4-1.6 mm. Surface longitudinal striate, slight lustrous, grey. 2n = 22.** Native to western Europe, rarely hauling with grass seeds and other crops into the Carpathians.

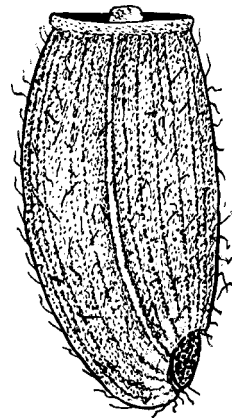
**3736. *Jacea nigra*** (L.) Hill, *Centaurea nigra* L. – Perennial, stems erect or ascendent, 30-100 cm high, simple or poorly branched above, roughened under



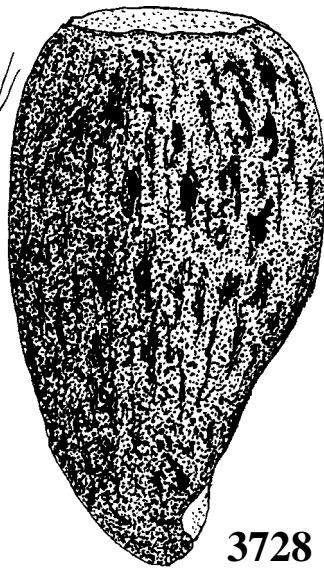
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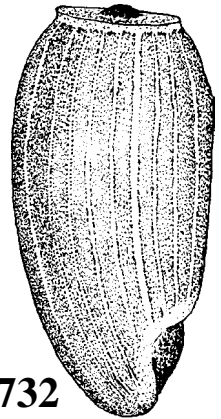
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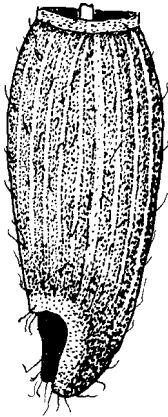
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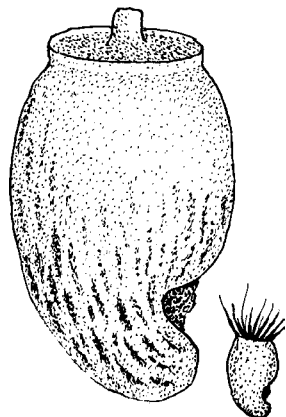
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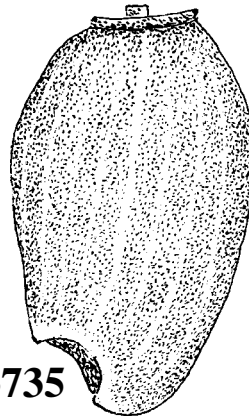
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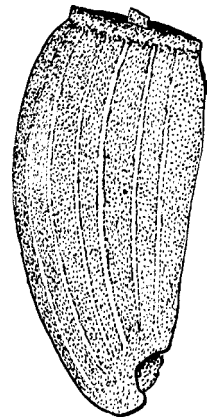
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capitulum. **Fruits achenes, cylindric, with very short (c. 1 mm) crest on top, lower part narrowed with hilum, 3-3.4 x 1.4-1.6 mm. Surface longitudinal faint striate, lustrous, greyish or brownish.  $2n = 22$ .** Originally growing in western Europe; rarely hauling with grass seeds into the Carpathians.

**3737. *Jacea nigrescens* (Willd.) Soják, *Centaurea nigrescens* Willd.** – Perennial, stems erect, 25-100 cm high, poorly ramified. **Fruits achenes, ellipsoid, with conical protuberance in the middle, crest rudimental, sometimes absent, large hilum below, 3.4-3.8 x 1.6-1.8 mm. Surface smooth or faint striate, lustrous, grey or brownish.  $2n = 44$ .** Native to Europe, grassy slopes, boundaries and embankments. Hu, Ro.

**3738. *Jacea pannonica* (Heuff.) Soják, *Centaurea pannonica* (Heuff.) Simonk.** – Perennial, stems single or 2-3, erect, 30-100 cm high, branched from half. **Fruits achenes, obconic, apex truncate with conical protuberance in the middle, without crest, bottom narrowed with hilum, 2.7-3 x 1.3-1.5 mm. Surface faint striate, slight lustrous, greyish or greyish-brown, sometimes with longitudinal stripes.  $2n = 22, 44$ .** Native to Europe, sunny, stony and semi-steppes, boundaries and saline meadows. Hu, Mo, Ro, Sk, Uk.

**3739. *Jacea phrygia* (L.) Soják, *Centaurea phrygia* L., *C. austriaca* Willd.** – Perennial, stems erect, 30-100 cm high, branched from half, seldom simple, roughened under capitulum. **Fruits achenes, cylindric, truncate on top, dirty white crest only 0.5-2 mm long, bottom with hilum, 3.8-4.2 x 1.8-2 mm. Surface smooth, poorly hirsute, slight lustrous, grey or greyish-brown.  $2n = 22$ .** Native to Europe, moister, semi-shadow and mountain meadows, forest clearings. Hu, Mo, Pl, Ro, Sk, Uk.

**3740. *Jacea pratensis* Lam., *Centaurea jacea* L.** – Perennial, stems erect or ascendent, 1-5 in tuft, 50-120 cm high, angular. **Fruits achenes, ellipsoid or obconic, with large protuberance in the middle, crest absent or only poor and short one, 2.5-3 x 1.2-1.4 mm. Surface faint striate or smooth, slight lustrous, grey or greyish-brown.  $2n = 22, 44$ .** Native to Europe, meadows, pastures, cut-over areas and forest margins. Hu, Pl, Ro, Sk, Uk.

**3741. *Jacea stenolepis* (A. Kern.) Soják, *Centaurea stenolepis* A. Kern.** – Perennial, stems up to 100 cm

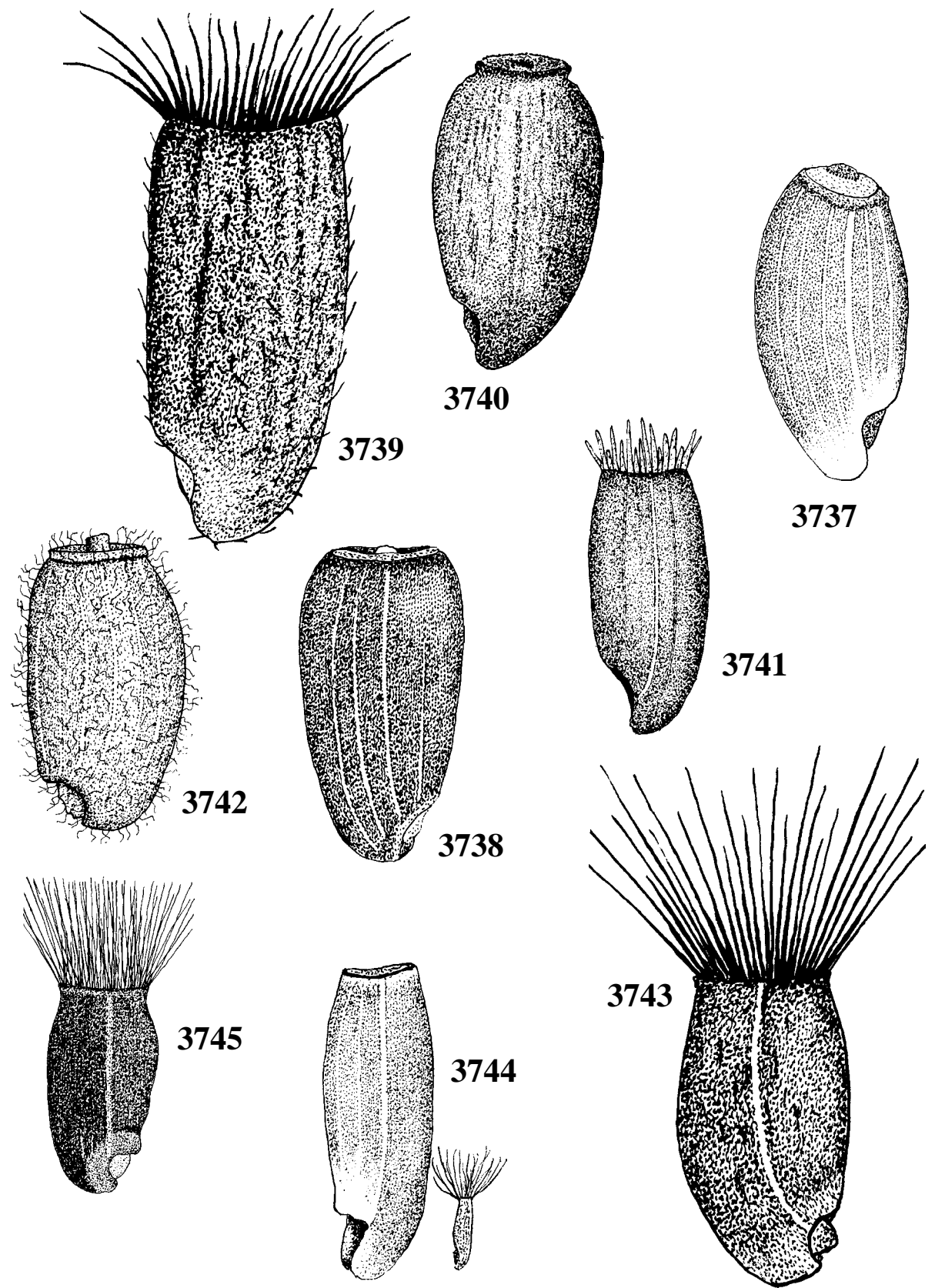
high, ramified above, densely leafy up to top. **Fruits achenes, cylindric, apex truncate, top with short, c. 0.5 mm long or rudimental crest, 3-3.8 x 1.3-1.7 mm. Surface with some longitudinal ribs or only faint striate, slight lustrous, grey or brownish.  $2n = 22$ .** Native to central Europe, sunny slopes, pastures, forest steppes, oak wood in particular. Hu, Mo, Pl, Ro, Sk, Uk.

**3742. *Jacea subjacea* (Beck) Soják, *Centaurea subjacea* (Beck) Hayek** – Perennial, stems erect, 30-50 cm high, densely leafed, above half poorly branched. **Fruits achenes, subcylindric, with large protuberance in the middle, without crest, bottom with hilum, 2.8-3.2 x 1.4-1.6 mm. Surface smooth or faint striate, soft, scarce hirsute, slight lustrous, grey or greyish-brown.  $2n = 44$ .** Native to Europe, sunny, shrubby and stony slopes. Hu, Mo, Ro, Sk.

**3743. *Cyanus atropurpureus* Baumg., *Centaurea atropurpurea* Waldst. et Kit., *C. kotschyana* Heuff.** – Perennial, stems erect, 1-2 m high, white tomentose, ramified below. **Fruits achenes, cylindric, apex truncate, crest as long as the achene or shorter, balance, outer bristles with papillas, interior 2-4x shorter, sloping inside, 4-4.5 x 1.7-2 mm. Surface smooth, lustrous, base hairy, brown to black.  $2n = 18$ .** Native to southeastern Europe, stony, shrubby areas and rocky crevices, dry uplands from lowland up to montane zones. Mo, Ro.

**3744. *Cyanus flosculosus* Baumg., *Centaurea nervosa* Willd.** – Perennial, stems erect or ascendent, 15-40 cm high, angular, simple, weakly ramified. **Fruits achenes, cylindric, truncate on top, crest brownish or violetish, 2-2.5 mm long, bottom with deep hilum, 4.6-5 x 1.5-1.8 mm. Surface with few longitudinal ribs, dull or slight lustrous, grey or violet.  $2n = 22$ .** Native to the Carpathians, Alps and Balkan mountains, hay-meadows and pastures of the subalpine and alpine zones. Ro.

**3745. *Cyanus heuffeliana* Rchb., *Centaurea kotschyana* Heuffel** – Perennial, stems erect, 20-90 cm high, angular, simple, tomentose, with one rarely two capitulum. **Fruits achenes, cylindric, apex truncate with crest as long as the achene, bottom with hilum, 5.5-6 x 2.4-2.7 mm. Surface glabrous, slight lustrous, brown.** Native to the Carpathians and the Balkan Mountains, on rocky and stony areas of the subalpine and alpine zones. Pl, Ro, Uk.



**3746. *Cyanus mollis*** (Waldst. et Kit.) J. et C. Presl, *Centaurea mollis* Waldst. et Kit. — Perennial, stems erect, 30-50 cm high, non- or poorly ramified, angular, non-winged. **Fruits achenes, cylindric, truncate top with 1-1.5 mm long, white to yellowish crest, hilum hairy, 5-5.6 x 2-2.5 mm. Surface smooth, lustreless, yellowish-white. 2n = 44.** Carpathian endemic of light mountain woods and wood margins, dwarf pine, mountain flowering meadows. Hu, Pl, Ro, Sk, Uk.

**3747. *Cyanus montanus*** (L.) Mill., *Centaurea montana* L. — Perennial, stems shortly ascendent up to erect, 20-80 cm high, poorly branched above, broadly winged. **Fruits achenes, ellipsoid or cylindric, apex truncate with white, 1.5 mm long crest, 5.4-6 x 2.4-2.7 mm. Surface glabrous, dirty-whitish, dull. 2n = 44.** Native to Europe, light forests and forest margins; mountain meadows. Hu, Sk.

**3748. *Cyanus orientalis*** Baumg., *Centaurea orientalis* L. — Perennial, stems erect, angular, 1-1.5 m high, young cobwebby tomentose, glabrescent later on, simple or ramified only above. **Fruits achenes, cylindric, truncate on top, crest as long as the achene or shorter, 4.5-5 x 1.9-2.1 mm. Surface dense, soft, hirsute, lustreless, brown to dark-brown, sometimes spotted. 2n = 20.** Native to Europe, on steppes, steppe, stony and sandy slopes. Mo, Pl, Ro, Uk.

**3749. *Cyanus roseus*** Baumg., *Centaurea trinervia* Stephan — Perennial, stems erect, 30-50 cm high, angular, greyish tomentose, simple or poorly ramified. **Fruits achenes, cylindric, truncate on top, yellowish-brown crest about 2 mm long, hilum on the bottom, 5.2-5.6 x 2.5-2.7 mm. Surface smooth, pallid.** Native to southeastern Europe, hay-meadows, pastures, steppes. Mo, Ro, Uk.

**3750. *Cyanus segetum*** Hill, *Centaurea cyanus* L. — Annual (biennial), stems erect, 20-80 cm high, ramified, angular. **Fruits achenes, cylindric, apex truncate, very dense 2-3 mm long crest, large hilum hairy, 5.4-6 x 1.5-1.8 mm. Surface fine striate, slight lustrous, soft hirsute, yellowish-grey. 2n = 24.** Native to southeastern Europe, hauling into the Carpathians with cereals, locally domesticated in forest steppes, shrubberies, fields; various cvs are cultivated in gardens.

**3751. *Cyanus triumphettii*** (All.) Dostál ex A. et D. Löve, *Centaurea triumphettii* All. — Perennial, stems erect or shortly ascendent, 10-70 cm high, simple or poorly ramified above. **Fruits achenes, cylin-**

**dric, apex truncate with short white crest (1-3 mm long), sometimes stunted, bottom with hairy hilum, 5.5-6 x 2.1-2.5 mm. Surface smooth or faint striate, slight lustrous, yellowish-grey. 2n = 22, 44.** Native to foothills of the Alps and Carpathians, calcareous rocks of warmer areas. Hu, Pl, Ro, Sk.

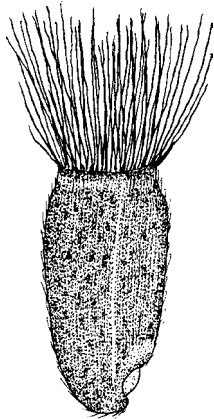
**3752. *Centaurea alba*** L. — Biennial or perennial, stems 10-80 cm high, erect, rarely ascending from the base, branched from the lower half, rarely simple. **Fruits achenes, cylindric, apex truncate, crest absent or shorter than 1/4 of the achene, large hilum on the bottom, 2.9-3.3 x 1-1.2 mm. Surface glabrous, longitudinal ± striped, lustrous, brown to blackish. 2n = 18.** Native to southern Europe, growing mostly in dry places, in many subsp. Ro.

**3753. *Centaurea apiculata*** Ledeb., *C. spinulosa* Rochel — Perennial, stems branched above, 60-80 cm high, leaves with arachnoid cover or glabrous, ± scabrid, pinnatifid. **Fruits achenes, cylindric, apex truncate, crest yellowish, 2.5-3 mm long, bottom narrowed with hilum, 4.8-5.8 x 1.9-2.1 mm. Surface with 4 whitish ribs, lustrous, pale pinkish. 2n = 20.** Native to southeastern Europe, in dry places, amongst shrubberies. Mo, Ro, Uk.

**3754. *Centaurea carniolica*** Host, *C. rotundifolia* (Bartl.) Hayek — Perennial, stems erect, 50-80 cm high, simple or with few branches, leaves sparsely tomentose. **Fruits achenes, ± barrel-shaped, with some ribs, apex truncate with conical protuberance in the middle, crest absent, 2.6-3 x 1.3-1.5 mm. Surface shallow longitudinal furrowed, lustrous, pale-greyish.** Native to the South-East Alps and the Mediterranean, pastures, shrubberies and wood margins, boundaries. Hu, Ro.

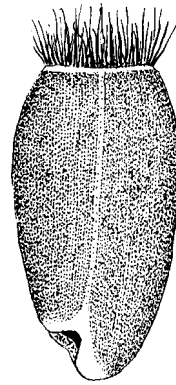
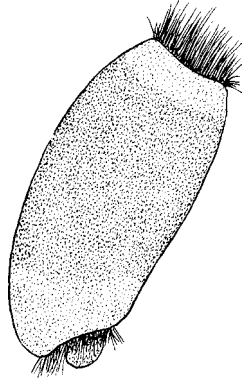
**3755. *Centaurea cuneifolia*** Sibth. et Sm., *C. pallida* Friv. — Biennial, stems erect, 30-60 cm high, branched in the middle, leaves white-tomentose, sometimes glabrescent. **Fruits achenes, oblong, barrel-shaped, crest 1/4-2/3 as long as the achene, bottom narrowed with hilum, 3.2-3.6 x 1.3-1.5 mm. Surface glabrous with few longitudinal stripes, lustreless, greenish-grey.** Native in southern Europe, stony hill-sides. Ro.

**3756. *Centaurea dealbata*** Willd., *Psephellus dealbatus* (Willd.) Boiss., *P. calocephalus* Cass. — Perennial, stems up to 100 cm high, erect or ascending, branched, leafy, leaves tomentose beneath,

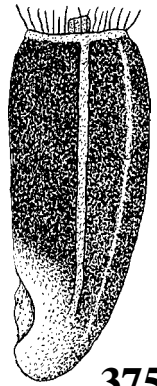


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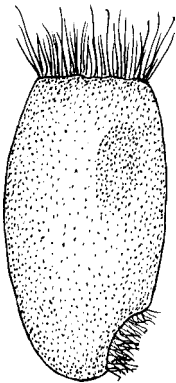
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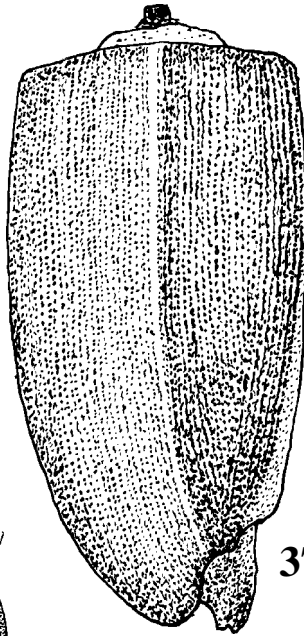
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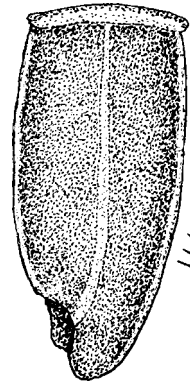
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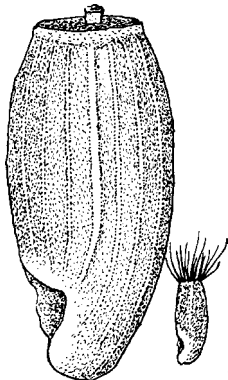
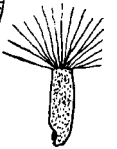
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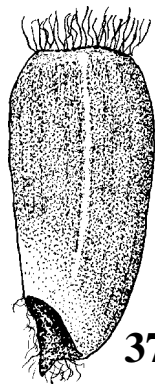
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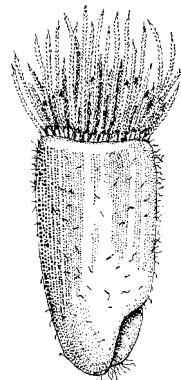
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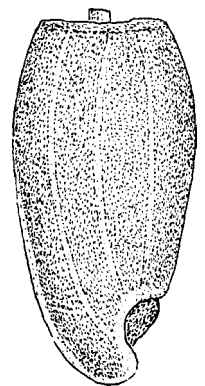
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flowers light-pink or deep violetish-red. **Fruits achenes,  $\pm$  ellipsoid, lateral compressed, apex truncate with conical protuberance in the middle and short and minute crest, 5.5-6 x 2.5-2.9 mm. Surface smooth, indistinct striate, lustrous, pale reddish-brown.** Native to the Caucasus, subalpine meadows; in the Carpathians cultivated as ornamental in gardens.

**3757. *Centaurea fritschii*** Hayek, *C. grinensis* Reuter subsp. *fritschii* (Hayek) Dostál — Perennial, stems up to 100 cm high, corymbosely branched, leaf segments oblong-lanceolate. **Fruits achenes,  $\pm$  cylindric, crest as long as the achene, 3.3-3.7 x 1.5-1.7 mm. Surface longitudinal striate, faint lustrous, grey. 2n = 20.** Native to central Europe, grassy places and shrub-beries. Hu, Ro.

**3758. *Centaurea micranthos*** S. G. Gmel. ex Hayek, *C. maculosa* Schmalh. p. p. — Biennial (perennial), stems 25-75 cm high, ribbed-furrowed, leafy up to the apex, flowers pink. **Fruits achenes, barreled, slight compressed with short (c. 1/3 of the achene) crest at the apex c. 1 mm long, white, 3.3-3.7 x 1.4-1.6 mm. Surface smooth, longitudinal striate, lustrous, pale-brown.** Native to southeastern Europe, dry steppes, chalky and clayey stands. Hu, Mo, Ro, Uk.

**3759. *Centaurea odessana*** Prod. — Biennial, stems 30-70 cm high, arachnoid-pubescent, single or 3-5 in tuft, branched from the base or from the middle. **Fruits achenes, cylindric, apex with short crest (1/4 of the achene), 3.1-3.5 x 1.3-1.5 mm. Surface smooth, lustrous, dark-brown to blackish.** Native to southeastern Europe, growing in maritime sands and sandy steppes. Uk.

**3760. *Centaurea pulcherrima*** Willd. — Perennial, stems 50-60 cm high, with large tender and pink flowers. **Fruits achenes, obconical, lateral compressed, apex with narrow collar, yellowish crest as long as the achene, 5.3-6 x 2.3-2.7 mm. Surface longitudinal ribbed, dull, pale to blackish-brown.** Native to the Caucasus, growing on mountain meadows and overgrown rocks; in the Carpathians cultivated in rock-gardens on sunny and dry stands.

**3761. *Centaurea ruthenica*** Lam., *C. schwarzenbergiana* Schur — Perennial, stems erect, 60-80 cm high, glabrous, striate, simple, ramified above. **Fruits achenes, cylindric, truncate on top, crest nearly as long as the achene, 6-6.8 x 2.3-2.7 mm. Surface longitudinal striate, transversal sinuate in above**

**half, dull, from whitish, brownish to blackish.** Originally growing in Asia, hauling into eastern Europe, very rare on grassy coasts and sunny hills of the upland zone, seldom cultivated as ornamental in gardens. Pl, Ro, Uk.

**3762. *Centaurea salonitana*** Vis. — Perennial, stems erect, 50-100 cm high, angular, scabrous or  $\pm$  tomentose, poorly ramified. **Fruits achenes, obconic, apex truncate, brownish, crest about as long as the achene or longer, bottom with hilum, 5.7-6.3 x 2.6-3 mm. Surface smooth, slight lustrous, whitish to blackish. 2n = 20, 40.** Native to southeastern Europe, stony places, sunny hills and fields. Hu, Mo, Ro, Uk.

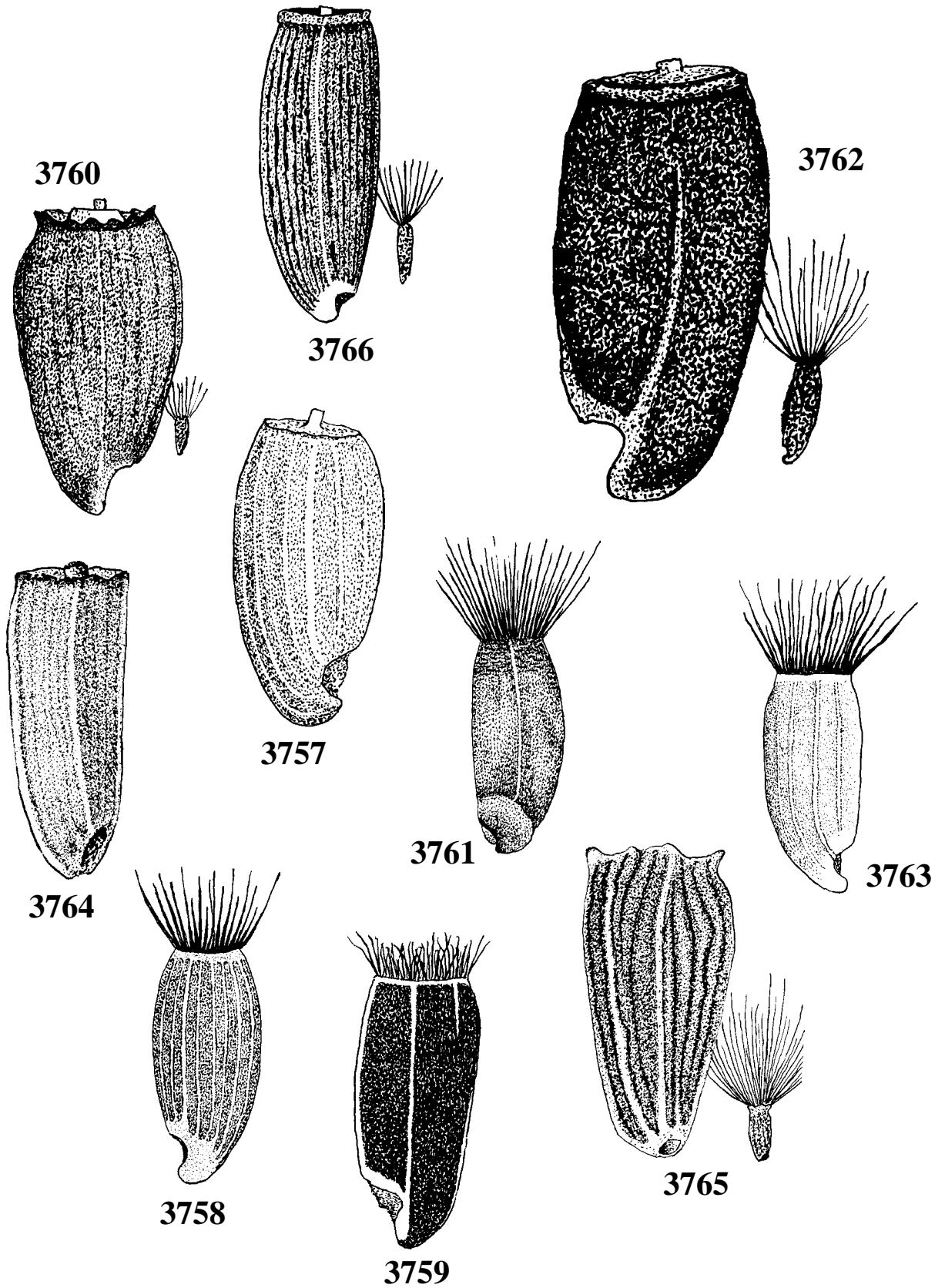
**3763. *Centaurea uniflora*** Turra — Perennial, stems 10-20 cm high, abundant, erect or ascending, leafy up to the apex, leaves lanate-tomentose, undivided, florets violet, rarely white. **Fruits achenes,  $\pm$  cylindric, apex with crest as long as the achene, yellowish to violetish, bottom with large hilum, 2.6-3 x 1.2-1.4 mm. Surface very fine longitudinal furrowed, lustrous, whitish grey.** Native to the South Carpathians and the northern part of the Balkan Peninsula, dry grasslands, rocky slopes of the montane and alpine zones. Ro.

**3764. *Leuzea salina*** Sprengel, *L. altaica* (Fischer et Sprengel) Link — Perennial, stems erect, 60-75 cm long, strong, simple, finely striate, decrescent leafy. **Fruits achenes, cylindric, 4-angular, slight compressed, notched corona on top, crest pale-yellowish of various lengths, 5.6-6.4 x 2-2.4 mm. Surface longitudinal faint striate, lustreless, light-brown, proper seed black.** Native to Euro-Siberia, saline meadows and other sites. Mo, Ro, Uk.

**3765. *Stemmacantha rhapontica*** (L.) Dittrich, *Centaurea rhapontica* L., *Leuzea rhapontica* (L.) Holub — Perennial, stem strong, erect, 50-70 cm high, lanate unramified, leafy only at base. **Fruits achenes, obconic, apex truncate, dense yellowish crest about 10 mm long, 6-7 x 2.8-3.2 mm. Surface longitudinal ribbed and furrowed, lustreless, brown. 2n = 26.** Native to the Alps, subalpine and alpine meadows; rarely cultivated as a popular medicinal plant in gardens.

**3766. *Grossheimia macrocephala*** (Muss.-Puschk.) Sosnowsky et Tachtajan, *Centaurea macrocephala* Muss.-Puschk. — Perennial, stems erect, up to 150 cm high, simple, strong, striate, crispy downy, capit-





ulum downy below. **Fruits achenes, cylindric, narrowed below, apex truncate, crest reddish-brown as long as or longer than the achene, 8-9 x 2.8-3.2 mm. Surface glabrous, lustreless, pale-brown with longitudinal brown stripe.** Originally growing in the Caucasus; in the Carpathians occasionally cultivated as ornamental in gardens, uniquely escaping.

**3767. *Crupina vulgaris* Cass., *Centaurea crupina* L.** — Annual, stems erect, 20-50 cm high, ramified above, leafed up to twigs. **Fruits achenes, short cylindric, apex truncate, crest blackish-brown, outer bristles rough, different, internal ones from sharp scales, 8-9 (with crest) x 2.3-2.7 mm. Upper part surface and hilum lanate, yellowish-brown, bottom part smooth, dark-brown. 2n = 30.** Native to Eurasia, sunny, stony slopes, karst steppes and sandy hills. Hu, Mo, Ro, Sk, Uk.

**3768. *Cnicus benedictus* L.** — Annual, stems erect, 30-80 cm high, cobwebby lanate, simple or extended branched. **Fruits achenes, cylindric or conic with tooth-leafed corona and two-rowed crest with ciliary bristles (10 external longer and 10 internal shorter), 9-10 (without crest) x 2-2.8 mm. Surface longitudinal ribbed and furrowed, lustreless, brown to dark-brown, bottom pale. 2n = 22.** Originally growing in the Mediterranean, from long time ago cultivated as a popular medicinal plant in gardens, transiently naturalized.

**3769. *Plectocephalus americanus* (Nutt.) D. Don, *Centaurea americana* Nutt.** — Annual, stems erect, 30-80 cm high, poorly branched, angular, roughened under capitulum. **Fruits achenes, ellipsoid, lateral flattish, with rusty crest at apex, bottom with large hilum, 3.8-4.2 x 1.3-1.5 mm. Surface with indistinct longitudinal stripes, slight lustrous, yellowish-grey.** Native to North America; in the Carpathians sometimes cultivated as a summer ornamental plant in gardens.

**3770. *Carthamus lanatus* L., *Phomus lanatus* (L.) Hill** — Annual, glandular, cobwebby lanate, stem erect, 20-60 cm high, poorly ramified above, densely leafed under capitulum. **Fruits achenes, 4-angular, external achenes wrinkly without crest, internal achenes smooth with scaled crest, 4-5 x 2.8-3.2 mm. Surface smooth or wrinkly, lustrous, whitish-brown. 2n = 44.** Native to Eurasia, sunny, stony slopes, overgrown loess hills and ruderal places. Hu, Mo, Ro, Sk, Uk.

**3771. *Carthamus tinctorius* L.** — Annual, stems erect, bare, 20-80 cm high, densely leafed, poorly ramified above. **Fruits achenes, obconic, apex broad, truncate, external achenes without crest, internal ones sometimes with scaled crest, 7-8 x 3.6-4.2 mm. Surface glabrous, lustrous, white. 2n = 24.** Originally growing in southwestern Asia; long time ago cultivated for its yellow dye-stuff, recently grown for its oil-seeds and know as Saflor, transiently naturalized. Hu, Mo, Ro, Sk, Uk.

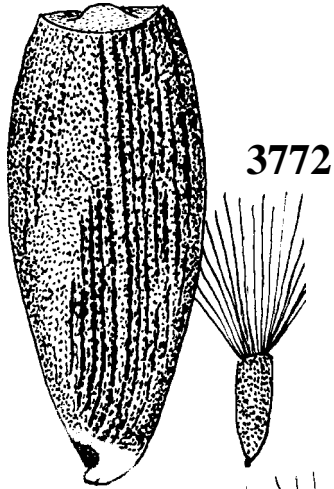
**3772. *Chartolepis glastifolia* (L.) Cass., *Ch. intermedia* Boiss.** — Perennial, stems up to 150 cm high, simple or sparingly branched, broadly winged, leafy throughout. **Fruits achenes, oblong, ± spindleform, compressed, outer crest bristles 8-10 mm long, the inner ones very short, 6.5-7 x 2.5-2.8 mm. Surface smooth, lustreless, pale greyish-brown.** Native to southeastern Europe, wet, saline grasslands. Mo, Ro, Uk.

## 153. CICHORIACEAE

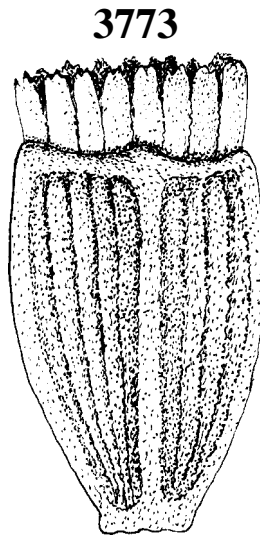
**3773. *Cichorium endivia* L.** — Annual to biennial, similar to *C. intybus*, stems 30-100 cm high, angular, glabrous, ramified. **Fruits achenes, obovoid, angular, apex truncate, scaled crest 1-2 rowed, 4x shorter than the achene, 3-3.6 x 1.4-1.8 mm. Surface lustreless, yellowish. 2n = 18.** Native to Mediterranean; in the Carpathians often cultivated in gardens as a vegetable of high culinary importance. Hu, Mo, Ro, Sk, Uk.

**3774. *Cichorium intybus* L., *C. divaricatum* Schur** — Perennial, stems erect, 30-120 cm high, ramified, bristly hirsute below. **Fruits achenes, obconic indistinct angular, apex truncate with scaly corona, crest scales about 0.2 mm long, 2.2-2.6 x 1.2-1.4 mm. Surface longitudinal furrowed, lustreless, pale-brown, brownish motley to blackish. 2n = 18.** Native to Eurasia, boundaries, pastures, meadows; in the whole Carpathians.

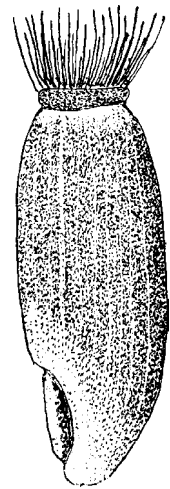
**3775. *Catananche coerulea* L.** — Perennial, stems 20-30 cm high, appressed hirsute, erect, poorly ramified, grooved, lanate. **Fruits achenes, conic, 6-8 ribbed, above with whitish crest from numerous fine bristles, narrowed below, 4.2-4.8 x 1.6-2 mm. Surface appressed setose, lustreless, brown to blackish. 2n = 18.** Native to southwestern Europe; in the Carpathians rarely cultivated as an ornamental summer plant in gardens.



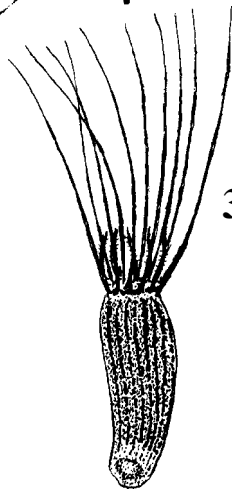
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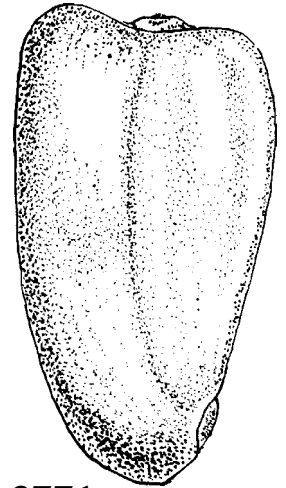
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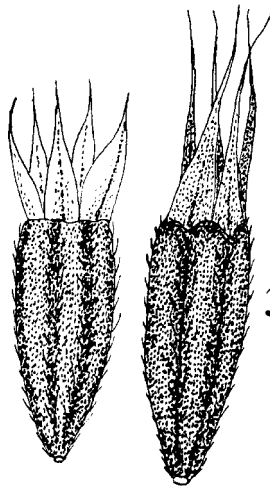
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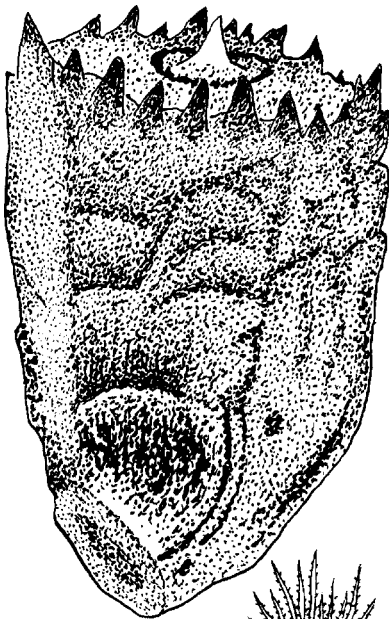
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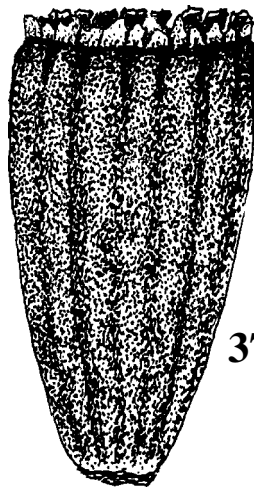
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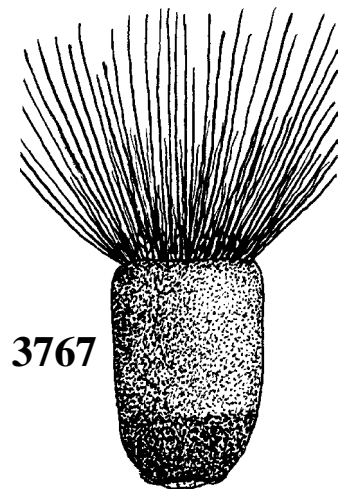
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**3776. *Tolpis barbata*** (L.) Gaertn., *Crepis barbata* L. — Annual, downy, stems erect, 10-90 cm high, simple, or ramified above. **Fruits achenes, cylindric, apex scaly coronate, crest shorter than the achene with 2-4 longer serrate bristles, 1.5-2 x 0.5-0.6 mm. Surface furrowed, slight wrinkly, lustreless, dark-brown. 2n = 18.** Native to the Mediterranean; in the Carpathians rarely cultivated as ornamental in gardens, occasionally escaping.

**3777. *Tolpis staticifolia*** (All.) Schultz-Bip., *Hieracium staticifolium* All. — Perennial, stem erect, simple or sparingly branched, 10-50 cm high, grooved, downy. **Fruits achenes, prolonged cylindric, apex truncate with rest of the style, whitish crest as long as or longer than the achene, bottom narrowed with round hilum, 2.8-3.2 x c. 0.5 mm. Surface grooved, glabrous, lustreless, brown. 2n = 18.** Native to Europe (Alps); its occurrence in the Carpathians dubious.

**3778. *Arnoseris minima*** (L.) Schweigg. et Koerte, *A. pusilla* Gaertner, *Hyoseris minima* L. — Annual, stems numerous, caespitose, 5-25 cm, erect, simple or few-branched, leafless. **Fruits achenes, ± cylindric, with 8 ribs, apex and bottom weakly narrowed, short border at apex, without crest, 1.6-2.2 x 0.6-0.7 mm. Surface faint lustrous, greyish-brown. 2n = 18.** Native to Europe, on sandy moist fields and fallows, at sandy pool margins. Br, Mo, Pl, Ro, Sk, Uk.

**3779. *Rhagadiolus stellatus*** (L.) Gaertn. — Annual, stems erect, 10-40 cm high, ramified, leafy, scarcely hirsute. **Fruits achenes, thorn-shaped with straight or crooked tip, basal part wide-spread, 10-15 x 1.3-1.5 mm. Surface fine striate, lustreless, yellowish-violet. 2n = 10.** Native to the Mediterranean, rarely hauling into the Carpathians. Uk.

**3780. *Aposeris foetida*** (L.) Less., *Lampsana foetida* Scop. — Perennial, plant 10-30 cm high, shedding milk, stinking. **Fruits achenes, prolonged obovate, compressed, apex and bottom truncate, without crest, 4-5 x 1.4-1.8 mm. Surface very short and dense hirsute, lustreless, brown. 2n = 16.** Native to Europe, moist woods and shrubberies, stony and loamy grounds. Br, Pl, Ro, Sk, Uk.

**3781. *Hypochoeris glabra*** L. — Annual (perennial), stems erect, mostly poorly ramified, roughened below flower heads, leaves in basal rosette. **Fruits achenes, of two types: marginal obconic, without beak, 4-6 mm long, crest 2x longer than the achene, 4-6 x**

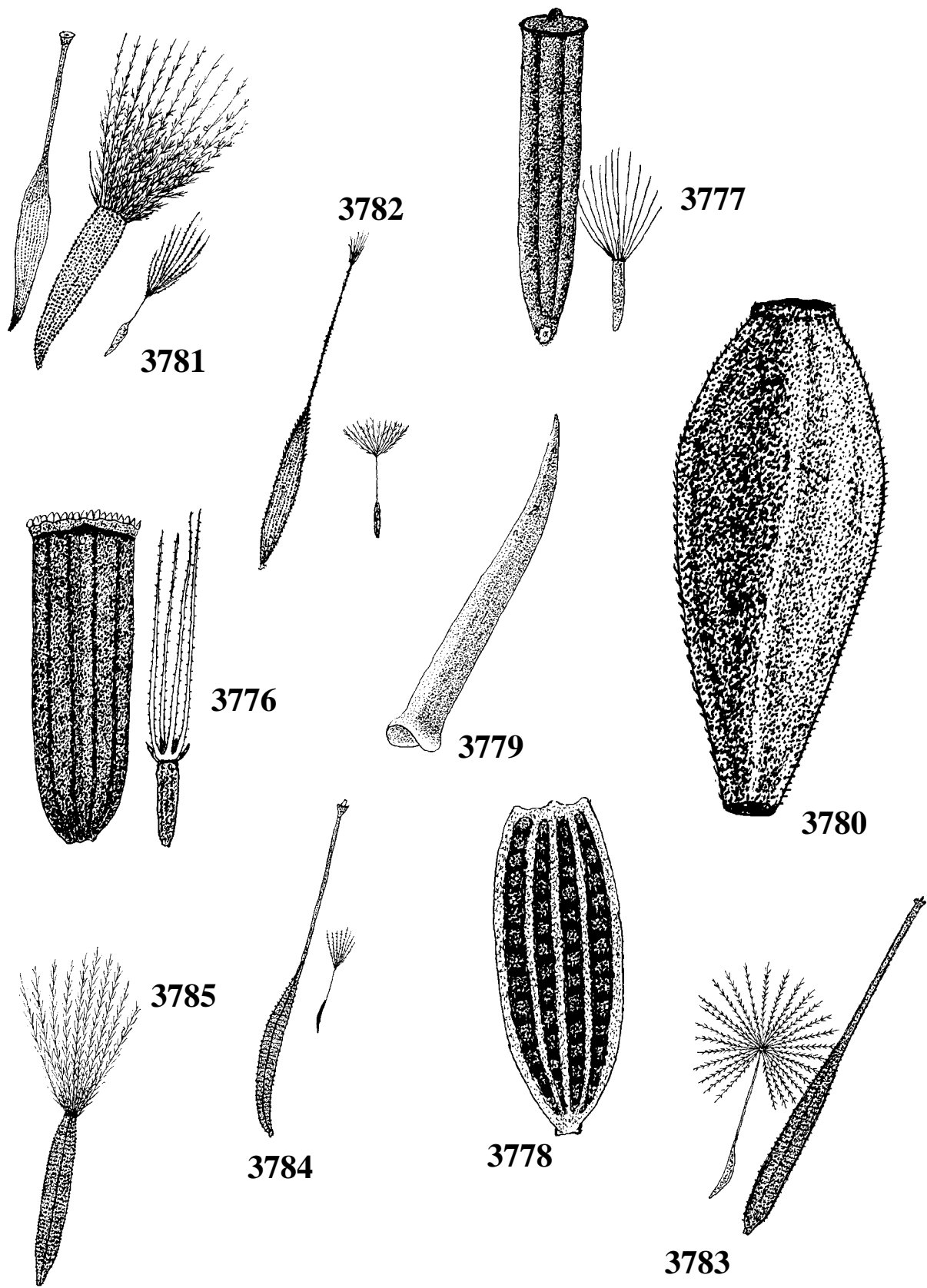
**0.8-0.9 mm; internal with long beak, c. as long as the achene, 7-10 x 0.7-0.9 mm; in both types bristles rough or plumose. Surface longitudinal ribbed, short prickly, lustreless, dark-brown. 2n = 10.** Native to Europe, dry meadows and pastures, boundaries, fallows and sunny hills. Pl, Ro, Sk, Uk.

**3782. *Hypochoeris radicata*** L., *Achyrophorus radicans* (L.) Scop. — Perennial, bare or bristly hirsute, glaucous. **Fruits achenes, cylindric, narrowed at both ends, long-beak with crest, or without beak (some marginal achenes), 5-10 x 0.5-0.6 mm. Surface longitudinal ribbed, together with beak short prickly, dull, violetish-brown, crest bristles plumose. 2n = 8.** Native to Europe, pastures, dry meadows, boundaries, forest margins and cut-over areas; throughout the Carpathians.

**3783. *Trommsdorffia maculata*** L., *Achyrophorus maculatus* (L.) Scop. — Perennial, stems erect, 15-90 cm high, simple, roughened under flower heads. **Fruits achenes, cylindric, narrowed at both ends, apex prolonged on beak and crest with plumose bristles, 10-16 x 0.6-0.7 mm. Surface longitudinally furrowed, transversally sinuate, lustreless, dark-brown. 2n = 10.** Native to Eurasia, light woods and shrubberies, meadows on moist and drying up grounds; in the whole Carpathians.

**3784. *Trommsdorffia uniflora*** (Vill.) Soják, *Achyrophorus helveticus* Scop., *Hypochoeris uniflorus* Vill. — Perennial, stem simple, erect, 10-20 cm high, leafless, upper half little roughed, hairy, downy under flower head. **Fruits achenes, cylindric, narrowed at both ends, apex prolonged into long beak, crest (10-13 mm) with plumose bristles, 17-23 x 0.9-1.1 mm. Surface longitudinal furrowed, transversal sinuate, brown. 2n = 10.** Native to Europe, alpine meadows, clearings in dwarf pine on moister stands. Pl, Ro, Sk, Uk.

**3785. *Leontodon autumnalis*** L., *Scorzoneroide autumnalis* (L.) Moench — Perennial, stems single or tufted, erect or ascendent, 10-60 cm, poorly ramified. **Fruits achenes, prolonged cylindric, upper and lower narrowed, crest as long as the achene, plumose, marginal achenes sometimes without crest, 5.2-6.2 x 0.5-0.7 mm. Surface longitudinal furrowed, transversal sinuate, dull, dark-brown. 2n = 12, 24.** Native to Eurasia; moist meadows, peats, dry fanlands, boundaries, pastures and fallows. Hu, Mo, Pl, Ro, Sk, Uk.



**3786. *Leontodon crispus*** Janka, *L. asper* (Waldst. et Kit.) Poir. — Perennial, stems usually numerous, 20-60 cm high, erect, unramified. **Fruits achenes, filiform, upper part thinner, broader below, crest plumose, as long as the achene, 7-10 x 0.8-1 mm. Surface longitudinal furrowed and ribbed, transversal slight wrinkly, lustreless, brown. 2n = 8.** Native to Eurasia, grassy and stony meadows, sunny hill slopes, loamy or calcareous dryer grounds. Mo, Ro, Uk.

**3787. *Leontodon croceus*** Haenke, *Apargia aurantiaca* Waldst. et Kit. — Perennial, stems 10-32 cm high, erect, single, glabrous below, hirsute above. **Fruits achenes, subcylindric, usually strait, below narrowed, yellowish crest plumose, 6-7 x 0.6-0.8 mm. Surface longitudinal furrowed, transversal wrinkly, lustreless, brown. 2n = 14.** Native to Europe (Alps and Carpathians), lawns, stony slopes of the subalpine zone. Pl, Ro, Uk.

**3788. *Leontodon danubialis*** Jacq., *L. clavatus* Schur — Perennial, stems 15-60 cm high, crooked at base, erect, glabrous later on. **Fruits achenes, subcylindric, slight bended, yellowish crest as long as the achene, internal bristles plumose, external ones with broad base, rough, 6-8 x 0.7-0.9 mm. Surface longitudinal furrowed, transversal slight wrinkly, verrucose, lustreless, brown.** Native to Eurasia, moist lawns of montane and subalpine zones. Br, Hu, Ro, Uk.

**3789. *Leontodon hispidus*** L., *Apargia hispida* (L.) Baumg., *Thrinicia hirta* Baumg. — Perennial, stems mostly single, erect or ascendent, 5-70 cm high, unramified, bare, striated. **Fruits achenes, prolonged cylindric, crooked, narrowed at both ends, internal ones narrowed up to beak, crest as long as or longer than the achene, bristles plumose, 6-8 x 0.6-0.8 mm. Surface longitudinal furrowed, transversal sinuate, slight lustrous, brown. 2n = 14.** Native to Europe, pastures, meadows, boundaries, embankments. Hu, Mo, Pl, Ro, Sk, Uk.

**3790. *Leontodon incanus*** (L.) Schrank, *Hieracium incanum* L. — Perennial, stems erect, single or in tuft, non-branched. **Fruits achenes, prolonged cylindric, at both ends narrowed, yellowish crest with two rows of bristles, internal ones plumose, external rough, 7-9 x 0.6-0.8 mm. Surface transversal wrinkly, lustreless, brown. 2n = 8.** Native to Europe, sunny and stony slopes and rocks, wood margins and shrubberies. Hu, Pl, Ro, Sk.

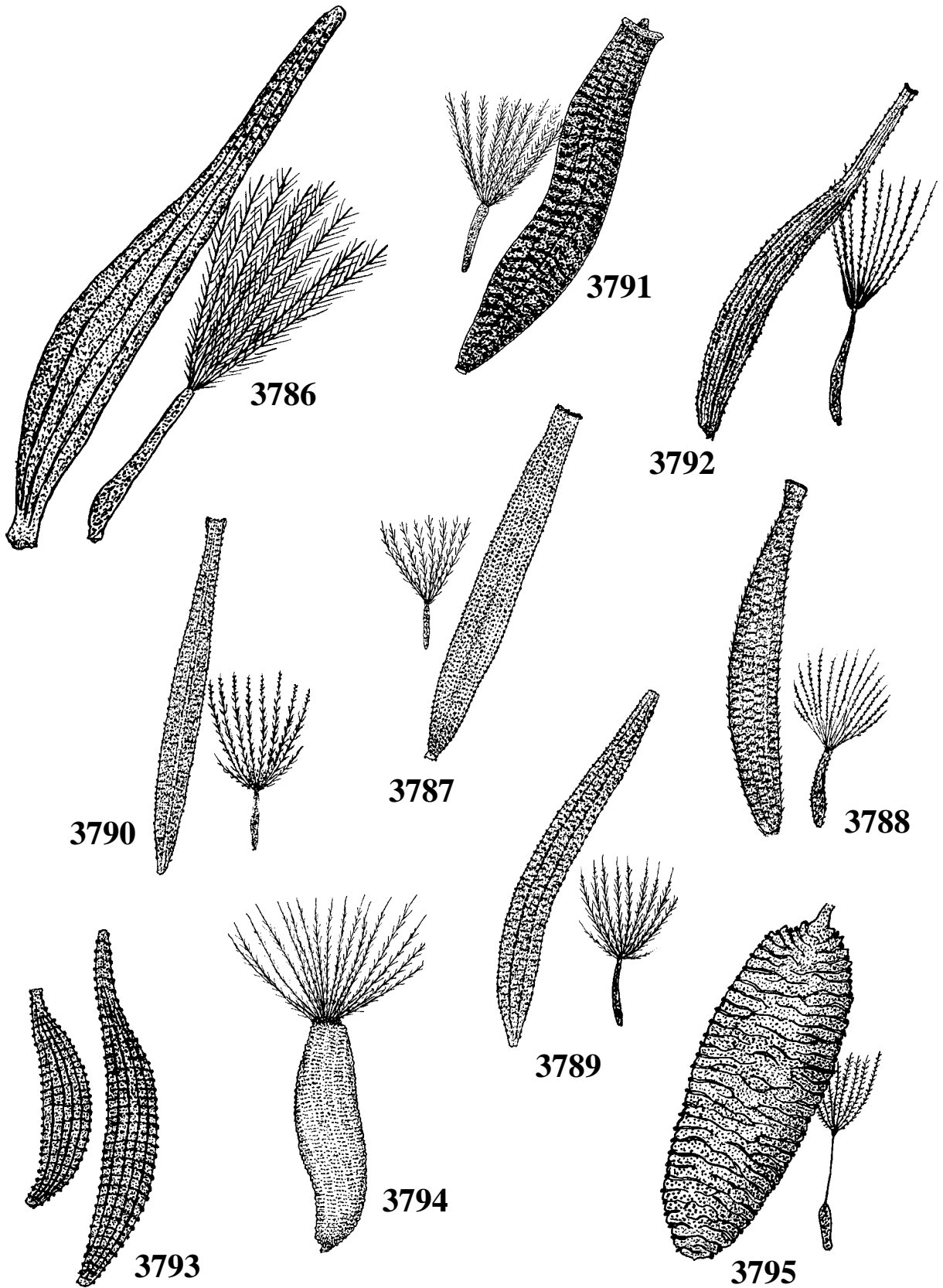
**3791. *Leontodon montanus*** Lam. — Perennial, stems 1-20 cm high, simple with numerous, long, simple, glandular hairs, leaves linear to oblanceolate, dentate, with long hairs. **Fruits achenes, cylindric or slight fusiform, narrowed at apex and bottom, crest bristles in two rows, the inner row plumose, the outer one not plumose, 5-6 x 0.7-0.9 mm. Surface longitudinal furrowed and transversal undulated, slight lustrous, brown.** Native to the mountains of central and southern Europe. Ro, Uk.

**3792. *Leontodon pseudotaraxaci*** Schur, *L. tatricis* Wol., *L. medius* Simk. — Perennial, stems single or 2-3, simple, erect, 5-20 cm high, roughened below capitulum. **Fruits achenes, prolonged cylindric, longitudinal furrowed, yellowish crest plumose, 4.5-5.5 x 0.9-1.1 mm. Surface transversal wrinkly, pale-brown, lustreless. 2n = 12.** Carpathians endemic, grassy stony mountain meadows, on calcite soils of the alpine zone. Pl, Ro, Sk, Uk.

**3793. *Colobium taraxacoides*** (Vill.) Holub, *Thrinicia saxatilis* (Lam.) Hand-Maz., *Colobium saxatile* (Lam.) Holub — Biennial to perennial, stems ascending up to erect, 3-35 cm high, thin, simple, with single capitulum, leafless, whole plant tomentose. **Fruits achenes, straight or bended, different size, apex with 7-10 mm long 2-rowed crest, internal achenes with longer beak and plumose bristles, marginal achenes with shorter beak and rough bristles, 3-7 x 0.6-0.8 mm. Surface longitudinal and transversal ribbed, lustrous, dark-brown. 2n = 8.** Native to Europe, sandy and moist brook and pool banks, moors, saline meadows and pastures. Sk.

**3794. *Picris hieracioides*** L. — Annual to perennial, stems 20-100 cm high, ramified, angular, abundantly ramified or simple. **Fruits achenes, prolonged ellipsoid, ± crooked, shortly beaked, whitish, one-row crest a little longer than the achene, plumose, 3-4 x 1-1.2 mm. Surface shallow transversal wrinkly, slight lustrous, dark- to reddish-brown. 2n = 10.** Native to Eurasia, dryer meadows and pastures, boundaries, embankments, wood margins, cut-over areas, fallows, mostly on calcareous grounds. Hu, Mo, Pl, Ro, Sk, Uk.

**3795. *Helminthotheca echioides*** (L.) Holub, *Picris echioides* L. — Annual to biennial, milk-shedding, stem 30-90 cm high, erect, ramified from half, bristly hirsute. **Fruits achenes, ellipsoid, internal achenes crooked, external straight, beak as long as the achene, crest deciduous, 2-rowed, internal row**



plumose, external one scaly, 3.3-4 x 0.9-1.2 mm. Surface transversal wrinkly, lustreless, external achenes whitish, internal orange to red-brown.  $2n = 10$ . Native to southern Europe; often hauling into the Carpathians, locally naturalized in fields, gardens and on riverbanks. Hu, Pl, Ro, Sk, Uk.

**3796. *Scorzonera austriaca*** Willd. — Perennial, stems single or tufted, erect, without leaves, with 3-6 scaly leaflets, bare. **Fruits achenes, prolonged cylindric, below a little crooked, whitish crest as long as the achene, balance, bristles plumose, 10-14 x 1.4-1.6 mm. Surface longitudinal ribbed, smooth or humpy, pale or violetish-brown.  $2n = 14$ .** Native to Europe, calcite and karst steppes. Au, Hu, Mo, Ro, Sk, Uk.

**3797. *Scorzonera hispanica*** L. — Perennial, stems erect, 30-120 cm high, above half branched, lower half leafed. **Fruits achenes, subcylindric, ends narrowed toward both, yellowish crest longer than the achene, plumose, 13-16 x 1.8-2 mm. Surface longitudinal ribbed, ribs humpy, interspace smooth or humpy, dull, dirty-white.  $2n = 14$ .** Native to Euro-Siberia, light woods and shrubberies, forest steppes, moist meadows. Hu, Mo, Pl, Ro, Sk, Uk.

**3798. *Scorzonera humilis*** L., *S. lanata* Schrank — Perennial, stems erect, 10-50 cm high, non-branched, scarcely leafy. **Fruits achenes, cylindric, longitudinal shallow ribbed, bottom 1/3 stronger, crest slight longer than the achene, bristles plumose, 8-11 x 0.9-1.1 mm. Surface smooth, lustreless, dirty-white to yellowish.  $2n = 14, 15$ .** Native to Europe, light woods and moister, peaty meadows. Hu, Pl, Ro, Sk, Uk.

**3799. *Scorzonera mollis*** M. Bieb. — Perennial, stems 5-30 cm high, solitary or few, simple or branched near the base, erect or ascending. **Fruits achenes, cylindric, apex with crest, its bristles c. as long as the achene, plumose, dirty-white, bottom part stronger than the upper one, 12-20 x 0.9-1.1 mm. Upper part surface squamulose, bottom smooth, weakly ribbed, pale-brown.** Native to southeastern Europe, steppes and steppe slopes. Mo, Ro, Uk.

**3800. *Scorzonera parviflora*** Jacq. — Biennial to perennial, bare, stems 10-50 cm high, single or poorly tufted, simple or with 1-3 twiglets. **Fruits achenes, subcylindric, upper part broader, lower one narrower, whitish crest 2x longer than the achene, plumose, 8-10 x 1.4-1.7 mm. Surface**

**smooth, ribbed, bare, pale-brown.  $2n = 14$ .** Native to Eurasia, saline, moist meadows and pastures. Hu, Mo, Ro, Sk, Uk.

**3801. *Scorzonera purpurea*** L. — Perennial, stem erect, 10-50 cm high, simple, or poorly branched above, cobwebby lanate under capitulum. **Fruits achenes, cylindric, mostly crooked, bottom broader, dirty-white crest as long as the achene, bristles plumose, dirty-white, 11-14 x 0.9-1.1 mm. Surface longitudinal 10-ribbed and furrowed, smooth, lustreless, pale-brown.  $2n = 14$ .** Native to Euro-Siberia, sunny, sandy slopes, rocky steppes, forest steppes, sandy pastures and pine forests; in the whole Carpathians.

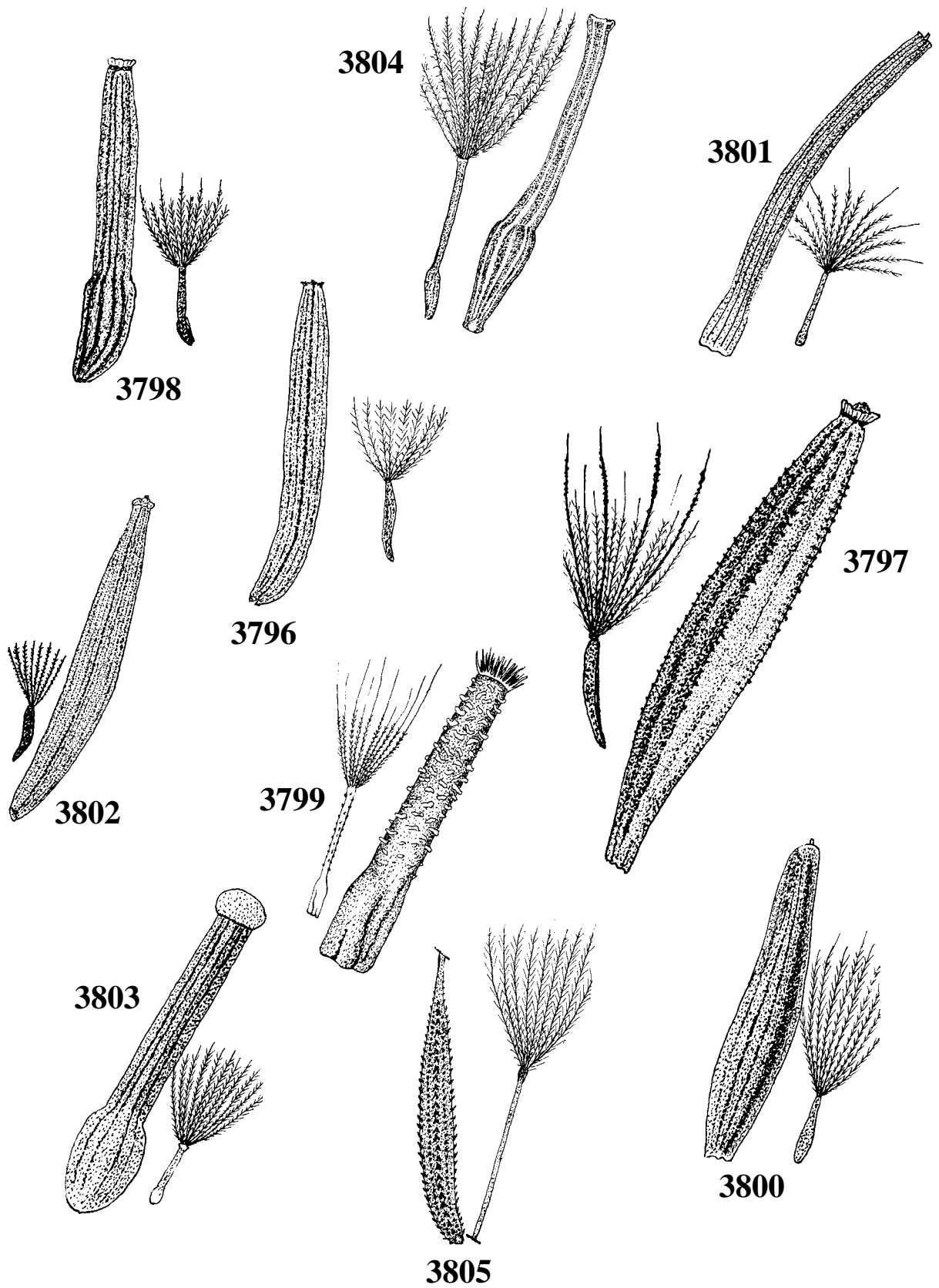
**3802. *Scorzonera rosea*** Waldst. et Kit. — Perennial, stems 20-50 cm high, erect or ascendent, simple, leafed only below. **Fruits achenes, prolonged cylindric, at both ends narrowed, yellowish crest plumose, as long as the achene, 13-15 x 1.4-1.6 mm. Surface longitudinal 10-ribbed, smooth, upper part humpy, lustreless, pale-brown.  $2n = 14$ .** Native to eastern Europe, mountain meadows, moist pastures. Pl, Ro, Sk, Uk.

**3803. *Podospermum canum*** C. A. Mey., *Scorzonera cana* (C. A. Mey.) Griseb. — Perennial, stems poorly tufted, erect or ascending, 5-60 cm high, upper half ramified, angular. **Fruits achenes, cylindric or shovel-shaped, often  $\pm$  crooked, bottom part broader and paler, yellowish crest as long as or 2x longer than the achene, plumose, 8-9 x 0.9-1.2 mm. Surface glabrous, dull, grey-brown.  $2n = 14$ .** Native to Eurasia, saline and dry pastures and meadows, boundaries, embankments, waste places. Hu, Ro, Sk, Uk.

**3804. *Podospermum laciniatum*** (L.) DC., *Scorzonera laciniata* L. — Annual to biennial, rarely perennial, stems erect or shortly ascendent, ramified, angular above. **Fruits achenes, shovel-shaped, lower part broader than upper one, yellowish crest as long as or a little longer than the achene, plumose, 12-14 x 1-1.5 mm. Surface longitudinal furrowed, ribs smooth, dull, dirty-whitish to greenish or pale-violetish.  $2n = 14$ .** Native to Eurasia, grassy and shrubby slopes, boundaries, vineyards, fallows, fields and road sides. Hu, Pl, Ro, Sk, Uk.

**3805. *Tragopogon dubius*** Scop., *T. campestris* Besser — Annual to biennial, stem erect, 20-60 cm high, simple or poorly ramified, very roughened,





hollow under capitulum. **Fruits achenes, prolonged cylindric, squamose, with beak as long as the achenes 5-angular, yellowish crest up to 2 cm long, plumose, 30-37 x 1.5-1.8 mm. Surface longitudinal ribbed, rich dentate and verrucose, lustreless, pale-brown.  $2n = 12$ .** Native to Europe, sunny and stony slopes, shrubberies, boundaries, waste places; in the whole Carpathians.

**3806. *Tragopogon floccosus* Waldst. et Kit., *T. brevirostris* DC.** — Biennial to perennial, young plant lanate, cobwebby later on, bare in fruit time, stems erect 20-50 cm high, ramified. **Fruits achenes, prolonged cylindric with five longitudinal ribs, beak short (2-4 mm) toroidal extended, yellowish crest as long as the achene, bristles of marginal achenes rough, internal ones plumose, 15-25 x 1-1.2 mm. Surface dentate, verrucose, lustreless, pale-brown.  $2n = 12$ .** Native to Europe, sandy uplands and pine woods. Hu, Pl, Ro, Sk, Uk.

**3807. *Tragopogon orientalis* L., *T. rumelicus* Velen.** — Biennial to perennial, stems 30-80 cm high, erect, simple or branched, leafed, glabrous, fine striate. **Fruits achenes, subcylindric, gradually thinner at both ends, beak shorter than the body of achene, crest plumose, 10-12 x 1.5-1.7 mm. Surface longitudinal ribbed, transversal wrinkly, rough verrucose, dull, brown.  $2n = 12$ .** Native to Europe, sunny, stony and grassy slopes, meadows, pastures, embankments and boundaries; throughout the Carpathians.

**3808. *Tragopogon porrifolius* L., *T. australis* Jord.** — Biennial, stem erect, 40-120 cm, ramified. **Fruits achenes, subcylindric, squamose-muricate with beak of the same length as achene, plumose crest shorter than the achene, 30-40 x 1.1-1.3 mm. Surface longitudinal ribbed, dentate, interspaces verrucose or smooth, lustreless, pale-brown.  $2n = 12$ .** Native to the Mediterranean, moist lowland areas; widely grown for its edible root and for ornament, locally naturalized. Ro.

**3809. *Tragopogon pratensis* L.** — Annual to perennial, stem simple or poorly ramified, 30-100 cm high. **Fruits achenes, subcylindric,  $\pm$  squamose, upper part prolonged into beak (as long as the achene), terminated with horizontal plumose crest, 10-24 x 1.4-1.6 mm. Surface longitudinal ribbed, rough verrucose, lustreless, brown.  $2n = 18$ .** Native to Europe, moist and flowery meadows, pastures, boundaries and old stone-pits. Pl, Ro, Sk, Uk.

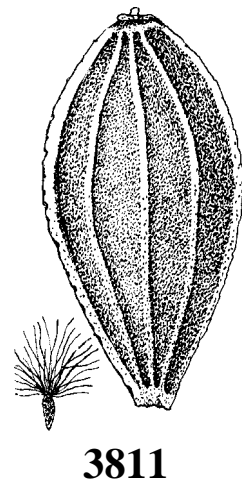
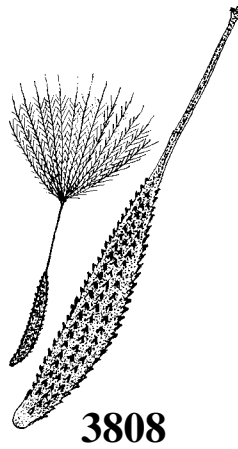
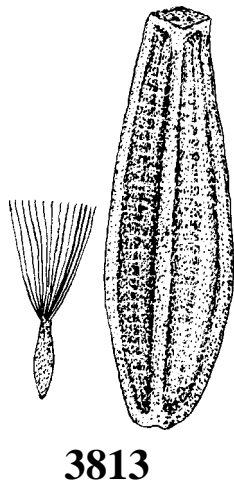
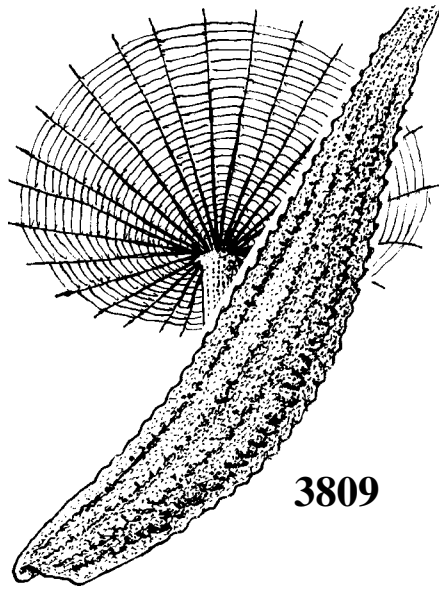
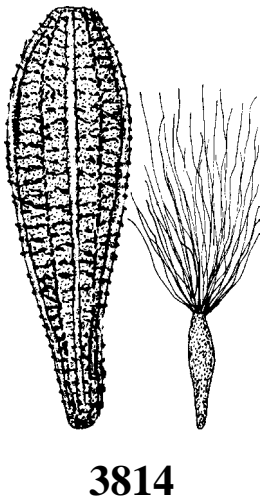
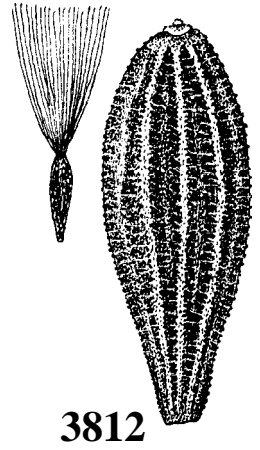
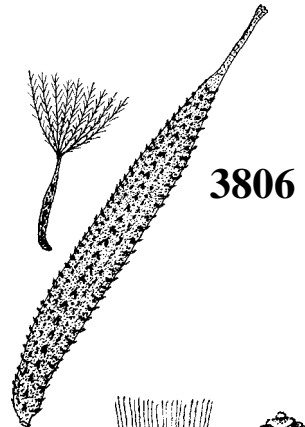
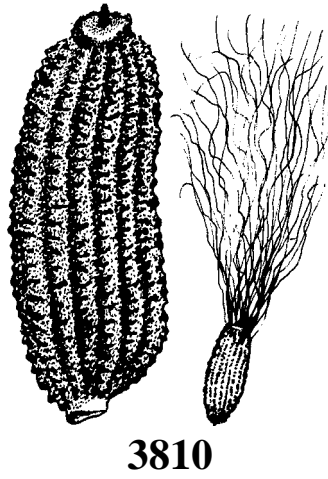
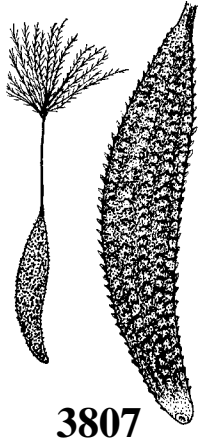
**3810. *Sonchus arvensis* L.** — Perennial, stems erect, 30-150 cm high, simple or ramified. **Fruits achenes, compressed, cylindric, longitudinal ribbed, apex with conical protuberance in the middle, with crest 10-14 mm long, rounded bottom with hilum, 3-3.5 x 1.1-1.3 mm. Surface transversal wrinkly, dense rugose, lustreless, chocolate-brown.  $2n = 54$ .** Native to Eurasia, fields, fallows, boundaries, waste places, steep slopes throughout the Carpathians.

**3811. *Sonchus asper* (L.) Hill** — Annual to biennial, bare, stem erect, 10-100 cm high, scarcely glandularly hirsute, ramified above. **Fruits achenes, flattish ellipsoid, compressed with small truncate protuberance in the middle of apex, deciduous crest 6-9 mm long, lower part narrowed with hilum, 3-3.5 x 1.4-1.6 mm. Surface longitudinal ribbed on dorsal and ventral sides (3+3) and winged on lateral sides, interspaces smooth, pale chocolate-brown.  $2n = 18$ .** Native to Eurasia, weed fields and gardens, waste grounds and dumps, in the whole Carpathians.

**3812. *Sonchus oleraceus* L., *S. laevis* Vill.** — Annual to biennial, stems erect, 10-120 cm high, bare, often glandularly hirsute above, simple or branched above. **Fruits achenes, prolonged elliptic or claviform, strong compressed and winged, longitudinal ribbed (3+3 on both sides and 2 marginal), with white 5-7 mm long crest at apex, 2.8-3.2 x 0.9-1.1 mm. Surface transversal fine wrinkly, lustreless, brown.** Native to Eurasia, field and garden weed, in waste places, ruderal areas; in the whole Carpathians.

**3813. *Sonchus palustris* L.** — Perennial, stem 1-3 m high, simple, 4-angular, dense glandular, paniculately ramified above, hollow. **Fruits achenes, prolonged elliptic or subcylindric, with 4 longitudinal ribs, quadrangle in section, white crest  $\pm$  7 mm long, deciduous, 3.7-4.9 x 1.1-1.3 mm. Surface transversal wrinkly between the ribs, lustreless, blonde.  $2n = 18$ .** Native to Eurasia, lowlands, woods, coastal thickets, boundaries, reed swamps; throughout the Carpathians.

**3814. *Sonchus tenerrimus* L.** — Perennial, stems erect or ascendent, 20-80 cm high, finely striate, glabrous, fistulous, ramified above. **Fruits achenes, claviform, compressed, with 4 longitudinal ribs, white crest about 5 mm long, 2.2-2.8 x 0.6-0.8 mm. Surface transversal, verrucose waved between the**



**ribs, lustreless, brown.  $2n = 14$ .** Native to the Mediterranean, grassy and ruderal places. Ro.

**3815. *Lactuca perennis* L.** — Perennial, stem erect, 30-80 cm high, ramified above. **Fruits achenes, elliptic, compressed, with strong lateral ribs and one intermedial rib on both sides, apex narrowed into long (10-14 mm) white beak and white crest as long as the achene, 6.5-8.5 x 1.8-2.2 mm. Surface minutely verrucose, dull, brownish-black.  $2n = 18$ .** Native to Europe, forest steppes, sunny overgrown rocks, stony slopes, vineyards. Hu, Ro, Sk.

**3816. *Lactuca quercina* L.** — Annual to biennial, stems erect, 30-150 cm high, hollow, striate, ramified. **Fruits achenes, prolonged obovate, with 8 longitudinal ribs, with short beak at apex, crest white, lower half gradually narrowed, 5.5-6.5 x 1.5-1.7 mm. Surface transversal, verrucose wrinkly, lustreless, setaceous, black.  $2n = 18$ .** Native to Eurasia, light leafy-woods and shrubberies, forest steppes, stony slopes. Hu, Pl, Ro, Sk.

**3817. *Lactuca saligna* L.** — Annual to biennial, stem erect, 30-100 cm high, whitish, ramified from base. **Fruits achenes, flattish, elliptic, with longitudinal ribs, apex with c. 5 mm long beak and white crest as long as or longer than the achene, 2.7-3.3 x 0.9-1.1 mm. Surface upper part dense muricate, lower longer part covered with small white excrescences, lustreless, brown.  $2n = 18$ .** Native to Eurasia, waste places, shrubby slopes, sunny pastures, stone-pits, fallows; in the whole Carpathians.

**3818. *Lactuca sativa* L.** — Annual to biennial, bare, stem erect, 30-100 cm high, broomy ramified above. **Fruits achenes, obovate, flattish, apex with 6-8 mm long beak, lower part gradually narrowed, 4-4.6 x 1.3-1.5 mm. Surface longitudinal ribbed on both sides, slight lustrous, whitish-grey.  $2n = 18$ .** The species originated probably in Egypt from *L. serriola*, at present commonly cultivated as a vegetable in gardens and fields, transiently escaping into compost heaps.

**3819. *Lactuca serriola* L., *L. hilumliola* L.** — Annual or biennial, stem erect, 30-150 cm high, bare or setaceous below, whitish. **Fruits achenes, prolonged obovate, compressed, white beak 6-8 mm long, crest white, tender, as long as the achene, lower part gradually narrowed up to small hilum, 2.8-3.2 x 0.9-1.2 mm. Surface longitudinal ribbed, interspace smooth, upper part prickly, dirty-green.**

**$2n = 18$ .** Native to Eurasia, roadsides, waste places, sunny stony slopes and shrubberies, embankments, boundaries, walls; nearly in all Carpathian territories.

**3820. *Lactuca tatarica* (L.) C. A. Mey., *Mulgedium tataricum* (L.) DC.** — Perennial, stem erect, 30-100 cm high, ramified above. **Fruits achenes, prolonged elliptic with short (1 mm) beak, white crest 2x longer than the achene, 4.5-6.5 x 0.9-1.1 mm. Surface longitudinal ribbed, glabrous, blackish-brown.  $2n = 18$ .** Native to Eurasia, littoral sands and rarely river-sides, as a weed and ruderal. Br, Mo, Ro, Sk, Uk.

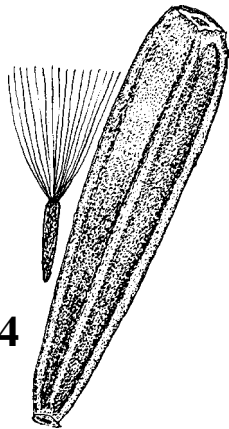
**3821. *Lactuca viminea* (L.) J. et C. Presl, *Scariola viminea* (L.) F. W. Schmidt** — Annual to perennial, bare, stem erect, hard, 30-80 cm high. **Fruits achenes, claviform, compressed, with long beak, white crest with rough bristles, 12-15 x 1.1-1.3 mm. Surface longitudinal ribbed or grooved, lustreless, black.  $2n = 18$ .** Native to Europe, sunny, shrubby and stony slopes, rocks, boundaries, fallows and walls. Hu, Mo, Ro, Sk.

**3822. *Lactuca virosa* L.** — Annual to biennial, stem erect, 50-150 cm high, bare or setaceous below, ramified above. **Fruits achenes, obovate, compressed, narrow winged, apex prolonged into 5-8 mm long beak with white crest, 3.6-4.2 x 1.4-1.6 mm. Surface with spiny longitudinal ribs, lustreless, black.  $2n = 18$ .** Native to the Mediterranean, barren places, field margins, roadsides, in the past cultivated as medicinal plant. Mo, Pl, Ro, Sk.

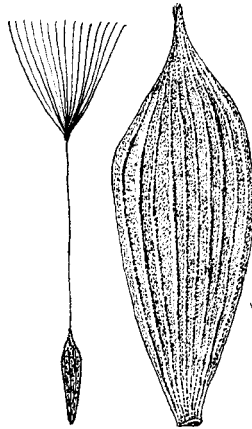
**3823. *Cicerbita alpina* (L.) Wallr., *Mulgedium alpinum* (L.) Less.** — Perennial, stem erect, 50-200 cm high, simple or ramified and red glandularly hirsute above. **Fruits achenes, cylindric or slight obconic, flattish, white crest 2x as long as the achene, 4.5-5.5 x 1.1-1.3 mm. Surface longitudinal ribbed, slight verrucose, lustreless, sandy.  $2n = 18$ .** Native to Europe, in mountain woods, dwarf pine areas, mountain meadows. Pl, Ro, Sk, Uk.

**3824. *Prenanthes purpurea* L.** — Perennial, bare, stem erect, 30-150 cm high, paniculately ramified above. **Fruits achenes, prolonged, cylindric, flattish, quadrangular in section, apex truncate with white crest, bristles simple, 5-6.6 x 1.1-1.3 mm. Surface longitudinal fine striate, lustreless, sandy.  $2n = 18$ .** Native to Europe, shady beech and coniferous forests, overgrown rocks, shrubberies, coastal thickets. Hu, Pl, Ro, Sk, Uk.

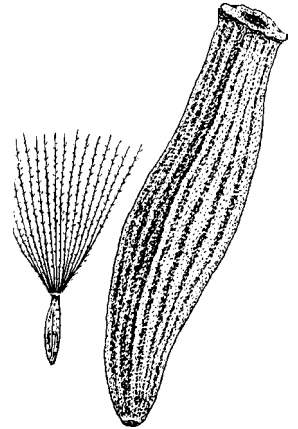
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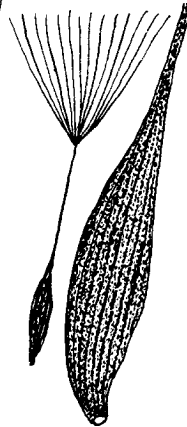
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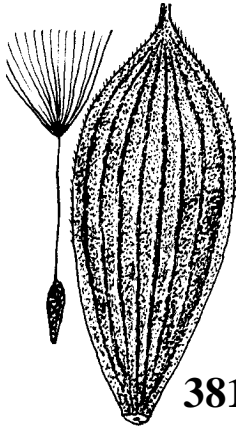
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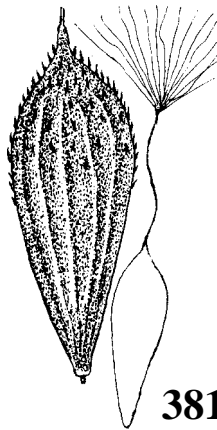
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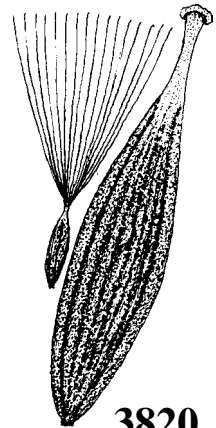
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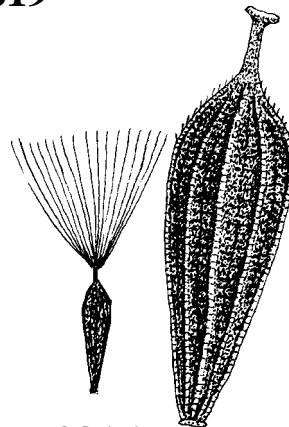
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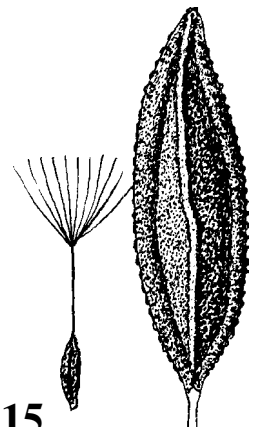
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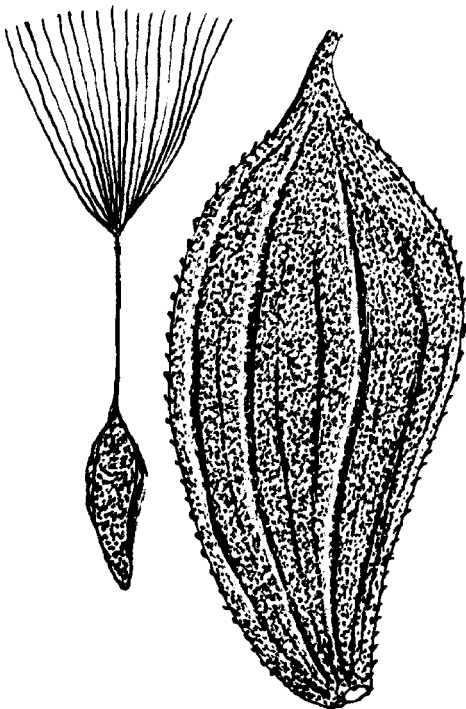
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**3825. *Mycelis muralis* (L.) Dumort., *Lactuca muralis* L.** — Perennial, bare, stem erect, 20-100 cm high, scarcely leafed, ramified above. **Fruits achenes, prolonged obovoid or obconic, flattish, with short (1 mm) pale beak, crest white, bristles simple, lower part gradually narrowed, 3.5-4 x 0.8-1 mm. Surface longitudinal ribbed, glabrous, slight lustrous or lustreless, black. 2n = 18.** Native to Europe, shady woods and shrubberies, overgrown rock-valleys. Hu, Mo, Pl, Ro, Sk, Uk.

**3826. *Taraxacum austriacum* Van Soest, *T. balticum* Dahlst.** — Perennial, stems 5-10 cm high, leaves oblong-linear, cut out, dentate. **Fruits achenes, cylindrical, laterally slight flattish, longitudinal ribbed and furrowed, upper part expressively spinulose, below part with smaller spines or without them, beak 6-7 mm long on the base with cylindrical nozzle, crest white with simple bristles, 2.5-2.7 x 0.6-0.7 mm. Surface slight hirsute, faint lustrous, reddish-brown. 2n = 16, 24.** Native to European saline meadows. Au, Sk (?).

**3827. *Taraxacum bessarabicum* (Hornem.) Hand.-Mazz.** — Perennial, peduncles 5-20 cm high, capitulum 15-20 mm in diam. **Fruits achenes, spindle-form, longitudinal furrowed, apex spiny, beak 4-6 mm long without nozzle on the base, white crest as long as the achene, 4.5-5.5 x 0.9-1.1 mm. Surface glabrous or scarce spiny, dirty-yellow (isabelline). 2n = 16.** Native to Europe, saline meadows and pastures. Hu, Mo, Ro, Uk.

**3828. *Taraxacum erythrospermum* Andr. ex Besser** — Perennial, stems 5-20 cm high, erect or ascending, thin, often reddish, with the rest of leaves at base, flowers pale-yellow, greyish or purplish striate. **Fruits achenes, cylindric, lateral compressed, longitudinal ribbed and furrowed, upper part spinulose, below spineless, tuberculate at ribs, apex with beak on the base with cylindrical broad nozzle and whitish crest, 3.3-4 x 0.8-1.2 mm. Surface of the ribs tuberculate, brown or reddish-brown. 2n = 16, 24, 32.** Native to Eurasia, sunny, dry, grassy and stony slopes, sandy uphills. Ro, Sk, Uk.

**3829. *Taraxacum kok-saghyz* Rodin** — Perennial, peduncles 15-25 cm high, capitulum 25-30 mm in diam. **Fruits achenes, spindleform, upper part of all corpus spiny, beak 6-9 mm long on the base with conical long nozzle, crest white, 3.4-4 x 0.9-1.1 mm. Surface ± spiny, lustreless, yellowish-brown.** Originally in east Asia; in Carpathians experimentally

cultivated (source of latex for rubber production) and uniquely naturalized. Hu, Ro, Sk.

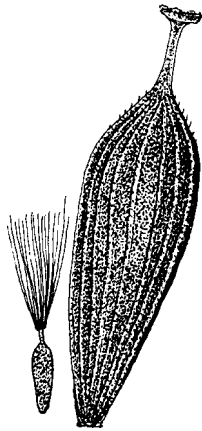
**3830. *Taraxacum officinale* Weber** — Perennial, peduncles 4-40 cm high, flower heads 25-75 mm in diam. **Fruits achenes, obconic, apex spiny, white beak 2-3x longer than the achene, on the base with conical broad nozzle, crest white, 3.5-4 x 0.9-1.1 mm. Surface longitudinal furrowed, spiny or verrucose, lustreless, greyish-brown. 2n = 16, 24, 32.** Native to Eurasia, meadows, fallows, lawns, boundaries, gardens, light woods and waste places in all Carpathian territories.

**3831. *Taraxacum palustre* (Lyons) Symons** — Perennial, peduncles 6-15 cm high, capitulum 25-50 mm in diam. **Fruits achenes, obconic, apex spiny in 3-5 rows, beak 6-9 mm long on the base with conical to cylindrical long nozzle, crest white, 3.5-4.5 x 1.2-1.4 mm. Surface longitudinal furrowed, transversal verrucose wrinkly, lustreless, straw-coloured to brown. 2n = 24, 32.** Native to Europe, swampy meadows, springheads, peatbogs and saline grounds. Hu, Pl, Ro, Sk.

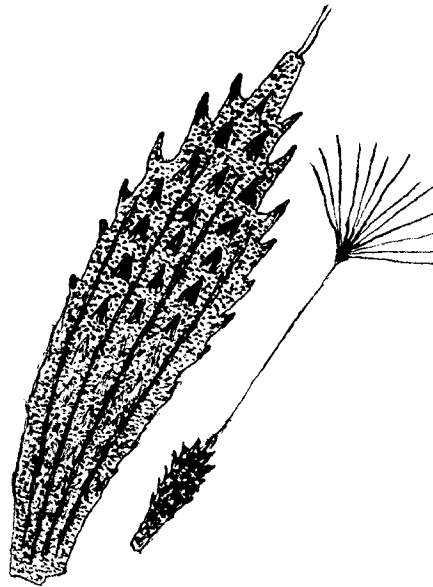
**3832. *Taraxacum serotinum* (Waldst. et Kit.) Poir.** — Perennial, peduncles erect, 5-20 cm high, capitulum 3-4 cm in diam. **Fruits achenes, spindleform, apex poorly spiny, beak 5-8 mm long without basal nozzle, greyish-white crest as long as the achene or shorter, 5.5-6.5 x 0.9-1.1 mm. Surface smooth or fine spiny, lustreless, greyish-brown. 2n = 16.** Native to Eurasia, dry, grassy semi-steppes, boundaries and fallows. Hu, Mo, Ro, Sk, Uk.

**3833. *Taraxacum silesiacum* Dahlst. ex Haglund** — Perennial, relatively small plant, stems 5-30 cm high, violetish, capitulum cobwebby-lanate below, 20-30 mm in diam., flowers yellow. **Fruits achenes, oblong, obovate, longitudinal ribbed and furrowed, beak c. 9 mm long with whitish crest, bristles of the crest simple, 3.4-3.8 x 0.8-0.9 mm. Surface lustreless, frail and scarce spinulose in upper part, ± smooth below, dark-brown. 2n = 24.** Native to Europe, grassy stands, drying up in summer, neutral soils. Hu, Pl.

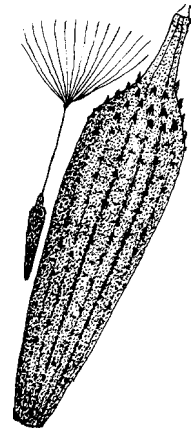
**3834. *Chondrilla chondrilloides* (Ard.) Karsten, *Ch. prenanthoides* (Scop.) Vill.** — Perennial, stems erect, 10-35 cm high, glabrous, ramified above. **Fruits achenes, prolonged obconic, beak thin, half or as long as the achene, crest 2.5x longer than the achene, 2.7-3 x 0.6-0.8 mm. Surface with longitu-**



3825



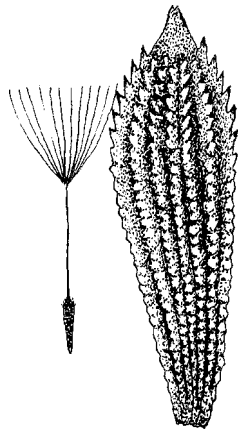
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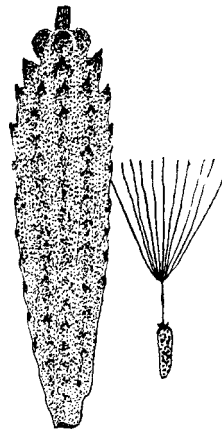
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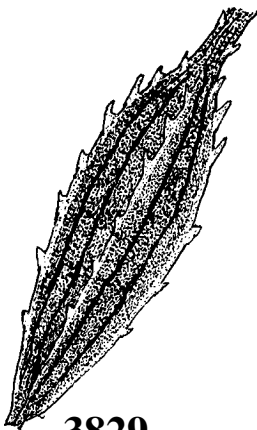
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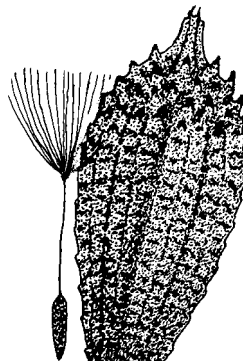
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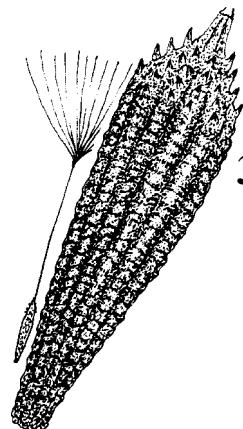
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dinal ribs, spiny above, the rest verrucose, slight lustrous, pale-brown. Native to the Alps, lime-stone mountains, stony slopes and screes; rarely hauling into the Carpathians. Ro.

**3835. *Chondrilla juncea* L.** — Biennial to perennial, stems erect, 50-100 cm high, usually solitary, angular, bristly hirsute below, bare above, ramified from half. **Fruits achenes, obcylindric, apex scaled or spiny, beak half or as long as achene, crest white, bristles simple, 3.5-4 x 0.5-0.7 mm. Surface longitudinal furrowed, verrucose (central part) or glabrous (lower part), lustreless, greyish-brown. 2n = 30.** Native to Eurasia, sunny slopes, embankments, vineyards, sandbanks and waste places of all Carpathian regions.

**3836. *Lapsana communis* L.** — Annual (perennial), bare or scarcely hirsute, stems erect, 10-125 cm high, angular, ramified above. **Fruits achenes, cylindric with a little crooked bottom, apex with small corona-style scar, crest absent, the outer achenes much longer than the inner ones, 2.8-3.5 x 0.7-0.9 mm. Surface longitudinal furrowed (c. 20 ribs), slight lustrous, pale-brown. 2n = 14.** Native to Europe, waste places, moist woods and shrubberies, fallows; in all Carpathian territories.

**3837. *Crepis alpestris* (Jacq.) Tausch, *Hieracium alpestre* Jacq.** — Perennial, stems erect, 15-45 cm high, crenate, hirsute, simple or branched. **Fruits achenes, slight compressed, spindleform, narrowed above, white crest shorter than the achene, bristles silky, simple, 8-12 x 0.7-0.8 mm. Surface longitudinal ribbed, transversal wrinkly, lustrous, pale or dark-brown. 2n = 8.** Native to Europe (Alps and Carpathians), mountain meadows, pastures, overgrown screes and rocks, light forests and shrub margins. Pl, Ro, Sk.

**3838. *Crepis biennis* L., *C. transsilvanicus* Schur** — Biennial, stems erect, 30-120 cm high, glabrous, angular, fistular, scarcely hirsute, branched from base. **Fruits achenes, slight compressed, cylindric, toward both ends slight narrowed, white crest as long as the achene or longer, 3.5-4.5 x 0.6-0.8 mm. Surface longitudinal ribbed (10-20x), glabrous, short hirsute, brown. 2n = 40.** Native to Eurasia, grassy boundaries, roadsides, meadows, fallows, light shrubberies and ditches. Hu, Mo, Pl, Ro, Sk.

**3839. *Crepis capillaris* (L.) Wallr., *Lapsana capillaris* L.** — Annual to biennial, stem 20-70 cm high, solitary, richly ramified from base, erect or ascendent, pubescent or glabrous. **Fruits achenes, cylindric with 10 ribs, white crest 2x as long as the achene, 2-2.5 x 0.4-0.6 mm. Surface glabrous, lustreless, brown. 2n = 6.** Native to Europe, fields, fallows, boundaries, dryer pastures and meadows, waste places. Hu, Pl, Ro, Sk, Uk.

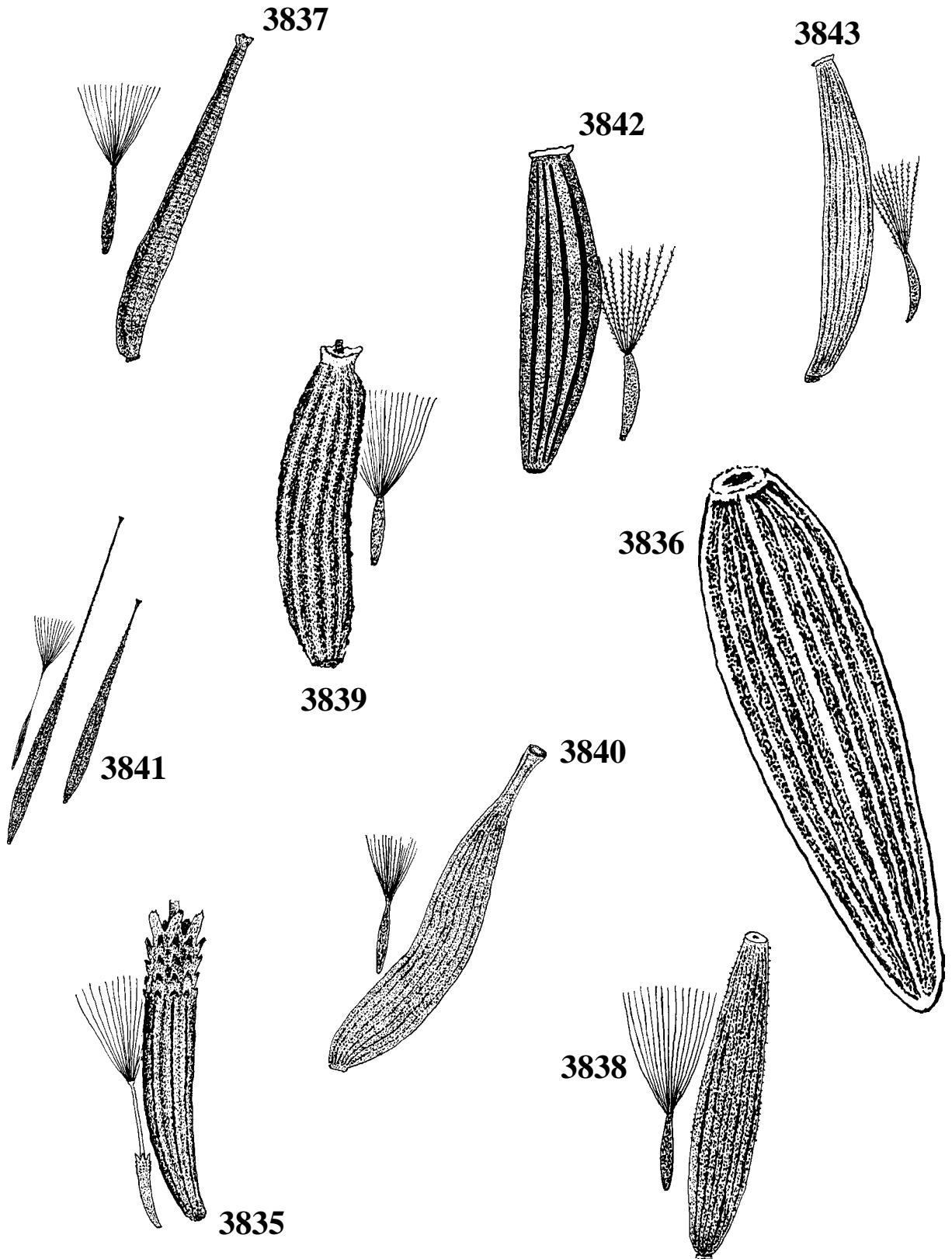
**3840. *Crepis conyzifolia* (Gouan) A. Kerner, *C. grandiflora* (All.) Tausch** — Perennial, stems erect, 15-50 cm high, angular, sparsely leafed, branched above. **Fruits achenes, slight flattish, spindleform (marginal with short beak), white crest shorter than the achene, 7.5-9.5 x 1.1-1.3 mm. Surface longitudinal ribbed (15-20x), glabrous, lustreless, yellowish-brown. 2n = 8.** Native to Europe, mountain meadows and pastures, overgrown screes, dwarf pine areas. Pl, Ro, Sk, Uk.

**3841. *Crepis foetida* L., *Barckhausia foetida* (L.) F. W. Schmidt** — Annual, stinking, shedding yellow milk, stems erect, 10-50 cm high, branched from the base or middle, angular, hirsute. **Fruits achenes, spindleform of two types: external rough with short or indistinct beak, internal longer with thin beak, white crest 5-6 mm long, 8-15 x 0.5-0.6 mm. Surface longitudinal indistinct ribbed, fine spiny, lustreless, dark-brown. 2n = 10.** Native to Europe, sunny ruderal hills, steppe meadows and forest steppes, vineyards. Ro, Sk.

**3842. *Crepis jacquinii* Tausch** — Perennial, stem erect, 5-25 cm high, with 2-5 single flower head twigs in upper half. **Fruits achenes, ± fusiform, flattish, with 10 up to 20 ribs, narrowed at both ends, whitish crest as long as or longer than the achene, 4.3-4.8 x 0.8-1 mm. Surface glabrous, slight lustrous, light-brown. 2n = 12.** Native to Europe (Alps and Carpathians), rocks, screes and stony mountain meadows. Pl, Ro, Sk.

**3843. *Crepis mollis* (Jacq.) Asch., *Hieracium molle* Jacq.** — Perennial, stem erect, 30-90 cm high, ramified only above, bare or hirsute, leafy. **Fruits achenes, spindleform, slight flattish, straight or crooked, ± 20 ribs, white crest as long as the achene, 4-4.5 x 0.5-0.7 mm. Surface fine striate, lustreless, yellowish- to reddish-brown. 2n = 12.** Native to Europe, moist mountain meadows, peatbogs in montane and subalpine zones. Br, Hu, Pl, Ro, Sk, Uk.





**3844. *Crepis neglecta* L.** — Annual, stems erect, 10-50 cm high, poorly leafed, branched from base, angular. **Fruits achenes, spindleform, with 10 longitudinal, rough ribs, apex narrowed into beak ( $\pm 0.5$  mm), white crest longer than the achene, 2-3 x 0.4-0.5 mm. Surface lustreless, pale-brown.  $2n = 8$ .** Native to Mediterranean, ruderal, barren places, roadsides, hauling into the Carpathians. Ro, Sk.

**3845. *Crepis nicaeensis* Balb.** — Annual to biennial, stems erect, 30-90 cm high, ramified above, bristly. **Fruits achenes, spindleform, apex narrowed into thin beak, white crest as long as the achene, deciduous, 4-5 x 0.5-0.6 mm. Surface longitudinal ribbed (10 ribs), slight lustrous, goldish-brown.  $2n = 8$ .** Originally growing in the Mediterranean, hay meadows, fields, shrubberies, uniquely hauling into the Carpathians. Hu, Pl, Ro, Sk.

**3846. *Crepis paludosa* (L.) Moench, *Hieracium paludosum* L.** — Perennial, stems erect, 30-100 cm high, angular, hollow, poorly branched above. **Fruits achenes, cylindric, 10 ribs, without beak, pale yellowish crest as long as the achene, 4.5-5.5 x 0.6-0.8 mm. Surface longitudinal furrowed, glabrous, pale-brown.  $2n = 12$ .** Native to Europe, moist and wet meadows, peatbogs of forest ditches and springheads. Hu, Pl, Ro, Sk, Uk.

**3847. *Crepis pannonica* (Jacq.) C. Koch, *Hieracium pannonicum* Jacq.** — Biennial to perennial, stems erect, 20-130 cm high, angular, densely leafy, upper half ramified, hirsute below, bare above. **Fruits achenes, spindleform or cylindric, apex narrowed into short beak, white crest as long as the achene, 5.5-6.5 x 0.9-1.1 mm. Surface longitudinal ribbed (15-20x), slight lustrous, dark-brown.  $2n = 8$ .** Native to Eurasia, sunny grassy and shrubby slopes, dry places. Hu, Mo, Pl, Ro, Sk, Uk.

**3848. *Crepis polymorpha* Pourr., *C. taraxacifolia* Thuill., *C. vesicaria* L.** — Annual or perennial, stems erect, 10-150 cm high, richly ramified. **Fruits achenes, spindleform, apex gradually narrowed into beak as long as the achene, white crest as long as the achene or beak, 6-8 x 0.4-0.6 mm. Surface longitudinal rough ribbed (10 ribs), lustreless, brown.  $2n = 8, 16$ .** Native to southern Europe, grassy places, road margins; rarely hauling into the Carpathians. Hu, Ro.

**3849. *Crepis praemorsa* (L.) Tausch, *Hieracium praemorsum* L.** — Perennial, stems erect, 15-75 cm

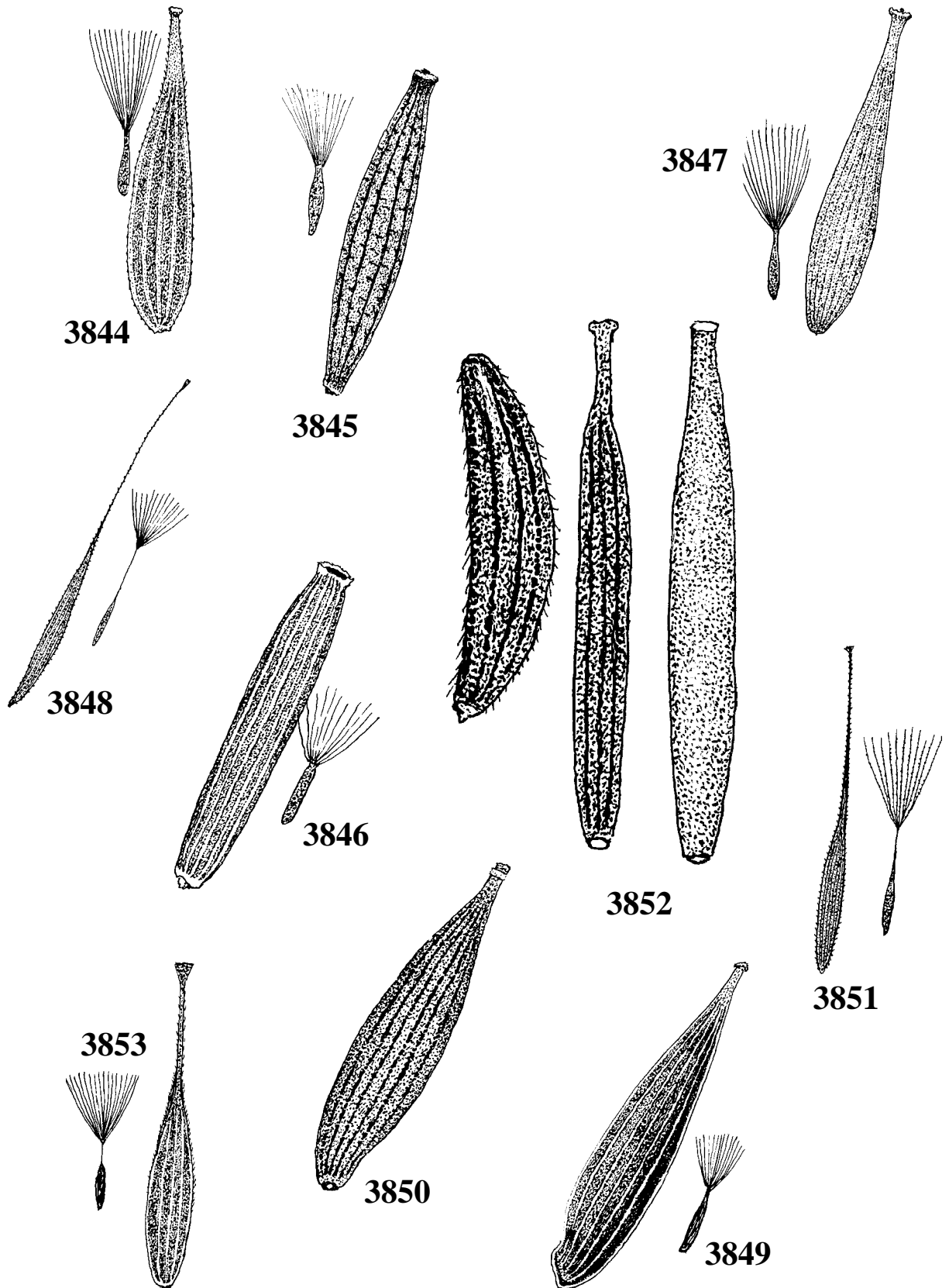
high, leafless, finely grooved, downy, ramified above. **Fruits achenes, cylindric or slight spindleform, slight compressed, white crest as long as the achene, 6-7 x 1.1-1.3 mm. Surface longitudinal ribbed ( $\pm 20$ ), glabrous, lustreless, pale-brown.  $2n = 8$ .** Native to Euro-Siberia, dryer meadows and pastures, light woods and shrubberies. Hu, Mo, Pl, Ro, Sk, Uk.

**3850. *Crepis pulchra* L., *Prenanthes viscosa* Baumg.** — Annual, stems erect, 20-100 cm high, angular, glandular below, bare above, ramified from the base. **Fruits achenes, of two types: marginal - longer, flattish and with beak, internal - shorter cylindric with very short beak or without it, white crest as long as the achene, 5-6 (marginal) or 4-5 (internal) x 0.9-1.1 mm. Surface longitudinal ribbed, glabrous, pale- or dark-brown.  $2n = 8$ .** Native to Eurasia, on steppe and shrubby dry slopes and hills, vineyards, boundaries. Hu, Ro, Sk, Uk.

**3851. *Crepis rhoeadifolia* M. Bieb., *Barckhausia rhoeadifolia* M. Bieb.** — Annual to biennial, stems 20-50 cm high, ramified, leafed. **Fruits achenes, spindleform, apex gradually into a long (4-8 mm), thin or roughened beak, white crest as long as the beak, 9-15 x 0.5-0.6 mm. Surface shortly hairy, longitudinal ribbed, transversal wrinkly, lustreless, brown.  $2n = 10$ .** Native to Europe, roadsides, rocky and stony slopes. Hu, Mo, Pl, Uk.

**3852. *Crepis sancta* (L.) Babcock, *Lagoseris sancta* (L.) K. Malý, *L. bifida* (Vis.) Koch** — Annual, stems 5-55 cm high, leaves with short, yellow simple, glandular hairs. **Fruits achenes, of 3 types (from left to right): outermost - broader fusiform, somewhat compressed, spinulose, 6-8 ribs and furrows, brown, in small amount, 1.8-2 x c. 0.5 mm; intermediate - narrower fusiform, apex narrowed, 6-8 ribs and furrows, brown, 3.2-3.6 x 0.3-0.4; inner - fusiform, smooth, whitish, 3.5-4 x 0.3-0.4 mm.  $2n = 10$ .** Native to the Mediterranean region and southeastern Europe; in the Carpathians naturalized in warmer areas. Mo, Ro, Uk.

**3853. *Crepis setosa* Haller fil., *C. hispida* Waldst. et Kit.** — Annual, stems erect, 10-80 cm high, angular, white, bristly hirsute, ramified from half. **Fruits achenes, spindleform, apex gradually narrowed into 4-5 mm long beak, white crest about 10 mm long, 4-5 x 0.5-0.6 mm. Surface longitudinal rough ribbed (10 ribs), lusterless, yellowish-brown.  $2n = 6, 8$ .** Native to Europe, fields, fallows, pastures,



embankments and sunny slopes. Hu, Mo, Pl, Ro, Sk, Uk.

**3854. *Crepis sibirica* L.** — Perennial, stems erect, 30-150 cm high, striate, poorly branched above, downy and bristly hirsute. **Fruits achenes, fusiform, upper part narrowed with broader style scar, without beak, whitish-yellow crest as long as the achene, 6-9 x 1-1.2 mm. Surface longitudinal furrowed, lustreless, brown. 2n = 10.** Native to Eurasia, mountain meadows and shrubberies, wood margins in montane and subalpine zones. Mo, Pl, Ro, Sk, Uk.

**3855. *Crepis tectorum* L., *C. campestris* Schur** — Annual to biennial, stem 10-100 cm high, solitary, erect, angular or striate, ramified. **Fruits achenes, spindleform, apex often narrowed up to expressive beak, white crest longer than the achene, 3.5-4.5 x 0.6-0.7 mm. Surface longitudinal ribbed ( $\pm 10$ ), upper half short spined, slight lustrous, purplish-brown. 2n = 8.** Native to Eurasia, dryer sandy grounds, pastures, fallows, boundaries, waste places, walls. Hu, Mo, Pl, Ro, Sk, Uk.

**3856. *Hieracium alpinum* L.** — Perennial, stems erect or shortly ascendent, 10-30 cm high, simple or with 2-3 single capitulum twigs. **Fruits achenes, cylindric, crest white as long as or a little longer than the achene, bristles slight rough, 3.5-4 x 0.7-0.8 mm. Surface longitudinal ribbed and furrowed, glabrous, slight lustrous, dark-brown or black. 2n = 27.** Native to Euro-Siberia, mountain meadows and pastures, peatbogs, moist, non-calcareous grounds. Br, Pl, Ro, Sk, Uk.

**3857. *Hieracium argillaceum* Jordan** — Perennial, stems 30-100 cm high, with simple eglandular hairs below, stellately hirsute and glandular above. **Fruits achenes, cylindric, obconic, whitish crest 1.5-2x as long as the achene, 3-3.5 x 0.5-0.7 mm. Surface longitudinal ribbed, slight lustrous, black. 2n = 27.** Native to Eurasia, grassy and shrubby slopes, forest margins and overgrown rocks.

**3858. *Hieracium atratum* Fries, *H. alpinum-murorum*** — Perennial, stems 20-50 cm high, stellately, glandularly, sometimes simple hairy. **Fruits achenes, cylindric narrowed at bottom, whitish crest as long as or shorter than the achene, brittle, 3.5-4 x 0.6-0.7 mm. Surface longitudinal furrowed, faint lustrous or dull, brownish-black to black. 2n = 27, 36.** Native to the Alps; in the Carpathians growing

in 2 microspecies: *atrellum* (Zahn) Juxip and *subnigrescens* (Fries em. Norlin) Dahlst. Hu, Pl, Ro, Sk, Uk.

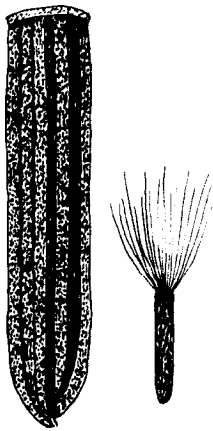
**3859. *Hieracium bifidum* Kit. ex Hornem.** — Perennial, stems 10-50 cm high, slender, thin, below hirsute, above tomentose, without glandular hairs. **Fruits achenes, cylindric, white crest 4-5 mm long, bristles rough, at bottom bended, 2.8-3.2 x 0.5-0.7 mm. Surface longitudinal furrowed, fine wrinkly, slight lustrous, blackish. 2n = 18, 27, 36.** Native to Europe, sunny overgrown rocks and slopes, deciduous woods on limestone grounds. Hu, Pl, Ro, Sk.

**3860. *Hieracium bupleuroides* C. C. Gmel.** — Perennial, stems erect, 20-50 cm high, glabrous or eglandular, longly hirsute only at base, ramified from half, basal leaves numerous. **Fruits achenes, rectangular, yellowish crest as long as the achene, bristles rough, 3.7-4.3 x 0.8-0.9 mm. Surface smooth, slight lustrous or lustreless, pale- or dark-brown. 2n = 27.** Native to Europe mountains, limestone rocks and screes. Hu, Pl, Sk, Uk.

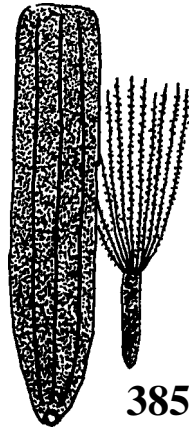
**3861. *Hieracium caesium* (Fries) Fries, *H. vulgatum* var. *caesium* Fries** — Perennial, stems (2-4) 20-80 cm high, with 1-10 capitulum, hairs simple, eglandular, flowers yellow. **Fruits achenes, cylindric, obconic, transversal section  $\pm$  quadrangular, apex with yellowish crest, c. as long as the achene, 3.4-3.8 x 0.7-0.8 mm. Surface smooth, ribbed-furrowed, lustreless, black. 2n = 27, 36.** Native to Europe, rocky and grassy slopes, wood margins and shrubberies, calcite grounds in particular. Hu, Pl, Ro, Sk.

**3862. *Hieracium carpathicum* Besser, *H. pocuticum* Woloszcz.** — Perennial, stems 20-70 cm high, leaves lanceolate-ellipsoidal, indistinctly dentate, beneath side densely hirsute. **Fruits achenes, cylindric, with yellowish crest at apex, crest as long as the achene, 2.8-3.2 x 0.7-0.8 mm. Surface with longitudinal narrow furrows, smooth, black.** Native to the in Sudetes-Carpathians, mountain forests. Cz, Pl, Sk, Uk.

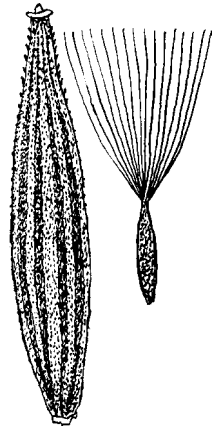
**3863. *Hieracium jankae* Uechtr.** — Perennial, stems 20-50 cm high, with dense simple eglandular and subplumose hairs (3-6 mm) and  $\pm$  numerous stellate hairs above. **Fruits achenes, cylindric, with 8 ribs, crest of unequal, brittle, pale-yellowish hairs, c. as long as the achene, 4-4.4 x 0.6-0.8**



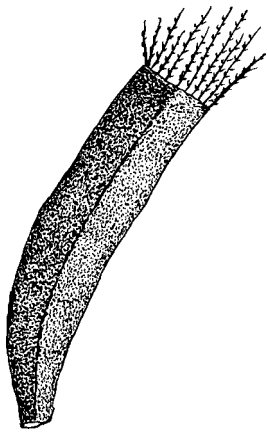
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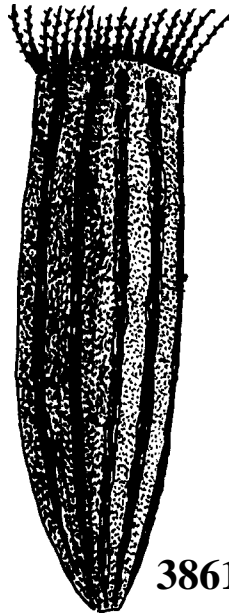
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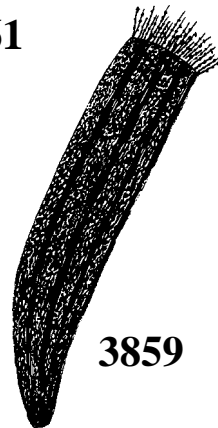
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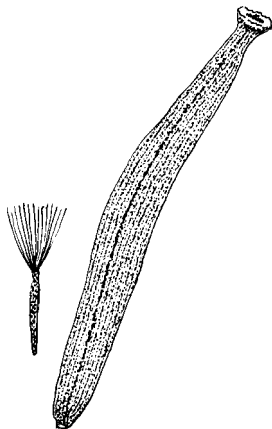
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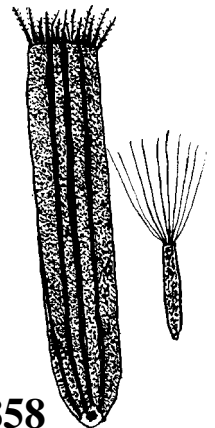
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3858

mm. Surface smooth, slight lustrous, pale-brown. Native to southeastern Europe (Romania, Bulgaria and Yugoslavia). Ro.

**3864. *Hieracium laevigatum* Willd.** — Perennial, stems 30-120 cm high, scarcely hirsute, starlike hirsute above, sometimes glandularly and eglandularly hirsute. **Fruits achenes, cylindric, whitish crest twice as long as the achene, bristles rough, 2.9-3.3 x c. 0.7 mm. Surface longitudinal partly ribbed, glabrous, slight lustrous, dark-brown to black. 2n = 27.** Native to Eurasia and North America, light wood and shrubberies, overgrown rocks and stone-pits, pastures. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**3865. *Hieracium maculatum* Sm.** — Perennial, stems 20-80 cm high, with glandular and eglandular hairs, leaves greyish-green, spotted reddish-brown. **Fruits achenes, cylindric, apex with whitish crest, bristles rough, 2.9-3.2 x 0.5-0.6 mm. Surface longitudinal furrowed, slight lustrous, black, involucre with glandular and eglandular hairs. 2n = 27.** Native to western and central Europe, sunny shrubby slopes. Hu, Ro, Sk.

**3866. *Hieracium murorum* L., *H. sylvaticum* (L.) Grufberg** — Perennial, stem erect, 20-80 cm high, simple, basal leaves numerous, rarely ramified, capitulum numerous, glandularly hirsute and leafless above. **Fruits achenes, cylindric, bended at bottom, whitish crest c. 3 mm long, bristles rough, 2.8-3.2 x 0.5-0.6 mm. Surface longitudinal furrowed, fine verrucose, slight lustrous, blackish-brown. 2n = 28, 36.** Native to Eurasia, grassy and stony slopes, overgrown rocks, forest margins and clearings. Br, Mo, Pl, Ro, Sk, Uk.

**3867. *Hieracium piliferum* Hoppe** — Perennial, stems erect, 10-40 cm high, scarcely or densely hirsute up to lanate, erect, usually unramified flower or with 1-5 flower heads. **Fruits achenes, cylindric, transversal section quadrangle, white crest as long as achene, bristles slight rough, 3.8-4.2 x 0.75-0.85 mm. Surface longitudinal ribbed, colliculate slight lustrous, pale-brown. 2n = 27.** Native to the Alps and Carpathians, 1700-2800 m, stony mountain meadows, slopes on non-calcite grounds. Pl, Ro.

**3868. *Hieracium pilosum* Schleich. ex Froel., *H. morisianum* Rchb. fil.** — Perennial, stems 10-30 cm high, mostly with 1 rarely 2-4 flower heads. **Fruits achenes, cylindric, crest yellowish, bristles c.**

**5 mm long, rough, bended at bottom, 3.5-3.8 x 0.6-0.7 mm. Surface longitudinal ribbed, slight lustrous, brownish-black or black. 2n = 27, 36.** Native to Europe, lime-stone overgrown rocks and mountain meadows. Ro, Sk.

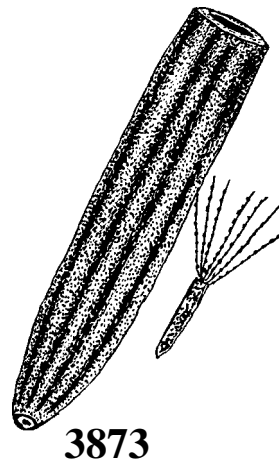
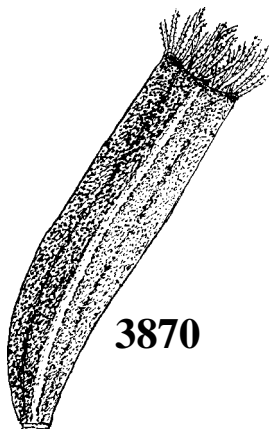
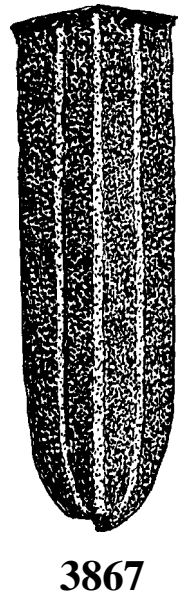
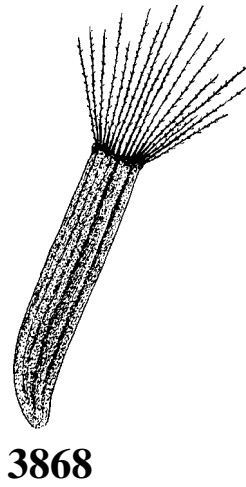
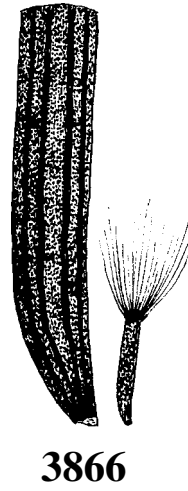
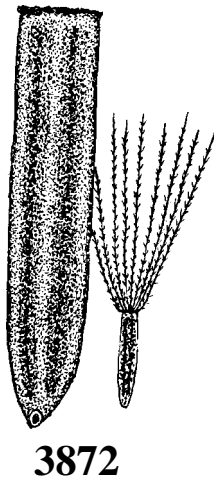
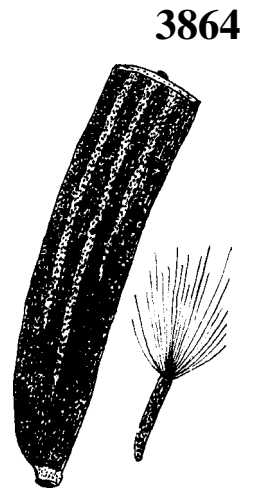
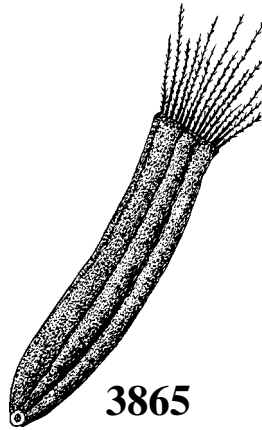
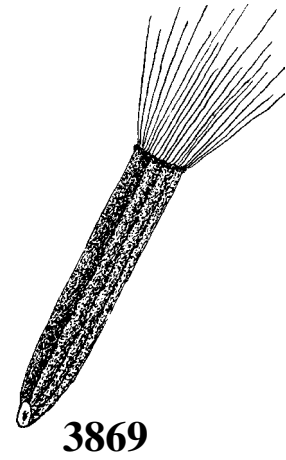
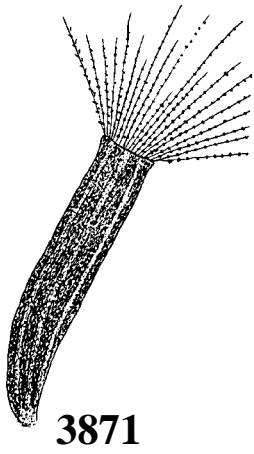
**3869. *Hieracium prenanthoides* Vill. subsp. *perforatum* (Froel.) Zahn** — Perennial, stems erect, 20-120 cm high, broomy ramified above, densely leafy, reddish hirsute and glandular below. **Fruits achenes, rectangular, cylindric, yellowish crest as long as achene, bristles rough, 3.3-3.6 x 0.5-0.7 mm. Surface smooth or ribbed, pale- or dark-brown. 2n = 27, 36.** Native to Eurasia, light woods and shrubberies, dwarf pine sites, mountain meadows of subalpine and alpine zones. Cz, Pl, Ro, Sk, Uk.

**3870. *Hieracium racemosum* Waldst. et Kit. ex Willd.** — Perennial, stems 10-100 cm high, erect, 5-10 mm long, scarcely to densely stellate hirsute, flowers yellow. **Fruits achenes, in section mostly quadrangular, white crest as long as the achene, bristles rough, 2.8-3.4 x 0.6-0.7 mm. Surface smooth or longitudinal ribbed, slight lustrous, pinkish- or pale-brown. 2n = 18, 27.** Native to Europe, light woods and shrubberies, forest margins. Hu, Pl, Ro, Sk.

**3871. *Hieracium sabaudum* L., *H. silvestre* Tausch** — Perennial, stem 50-150 cm high, non-glandular, densely stellate hairy. **Fruits achenes, cylindric, in section quadrangular, white-yellowish crest ± as long as achene, bristles rough, 3.3-3.7 x 0.6-0.8 mm. Surface smooth or longitudinal ribbed, lustrous, dark-brown. 2n = 18, 27.** Native to Europe, light woods and shrubberies, forest margins, frequent. Hu, Mo, Pl, Ro, Sk, Uk.

**3872. *Hieracium sparsum* Friv., *H. cernuum* Friv.** — Perennial, stems 10-30 cm high, ± bare, glabrous, curved, ramified, capitulum 2-12, with few florets. **Fruits achenes, cylindric and quadrangular, yellowish crest as long as or longer than the achene, bristles rough, 4-4.3 x 0.7-0.8 mm. Surface mostly smooth or longitudinal ribbed, lustreless, pale- to dark-brown. 2n = 18.** Native to the Balkan territory and southwestern Asia, rocky, sunny and grassy slopes. Pl, Ro.

**3873. *Hieracium transsilvaticum* Heuff., *H. rotundatum* Kit. ex Schult., *H. polytrichum* Schur** — Perennial, stem 30-80 cm high, erect, angular, hirsute below, glandular and lanate above. **Fruits achenes,**



cylindric with white crest, bristles rough, 3.3-3.7 x c. 0.6 mm. Surface longitudinal furrowed and ribbed, slight lustrous, black. Native to the Carpathians and the Balkan mountains, light shrubberies, forest margins. Hu, Pl, Ro, Sk, Uk.

**3874. *Hieracium tridentatum*** Fries – ground leaves 0-4, oblong-lanceolate, dentate, stem leaves numerous (6-20), below: stalky oblong-lanceolate, above: narrowly lanceolate, long and sharp acuminate. **Fruits achenes, cylindric, mostly bended below, longitudinal ribbed, 3-3.6 x 0.5-0.6 mm. Surface fine granulate, lustrous, black. 2n = 27.** Native to the higher mountains of Europe. Br, Hu, Pl, Ro, Uk.

**3875. *Hieracium umbellatum*** L. – Perennial, stem 20-150 cm high, bare or scarcely hirsute, starlike hirsute above, eglandular. **Fruits achenes, cylindric with ribs or quadrangular without ribs, yellowish-white crest 1.5-2x longer than the achene, bristles rough, 2.6-2.8 x 0.6-0.7 mm. Surface smooth or longitudinal ribbed, slight lustrous, dark-brown to black. 2n = 18, (27, 36, 64).** Native to Eurasia and North America, sunny, grassy and stony slopes, dry meadows and pastures, forest margins; in all Carpathian regions.

**3876. *Hieracium valdepilosum*** Vill. – Perennial, stems 20-50 cm high, with numerous simple, up to 8 mm long hairs and stellate hairs above. **Fruits achenes, cylindric, apex truncate, with yellowish crest, bristles a little longer than the achene, 4.2-4.6 x 0.8-1 mm. Surface with 8 ribs and furrows, lustrous, purplish-brown.** Native to the mountains of central Europe, and the Alps [subsp. *grabowskianum* (Naeg. et Pet.) Zahn]. Ro.

**3877. *Hieracium villosum*** Jacq. – Perennial, whole plant softly, white eglandular-hirsute, stems erect, 15-40 cm high. **Fruits achenes, cylindric, apex truncate with yellowish crest longer than the achene, bristles rough, 3.6-4.2 x 0.6-0.7 mm. Surface longitudinal shallow furrowed, slight lustrous, pale- and dark-brown. 2n = 27.** Native to Europe, high mountain meadows, pastures, overgrown rocks, reinforced screes on calcareous grounds. Pl, Ro, Sk, Uk.

**3878. *Hieracium vulgatum*** Fries, *H. lachenalii* auct. non C. C. Gmel., *H. acuminatum* Jord. – Perennial, stems 20-80 cm high, hirsute eglandular, with 2-5 leaves. **Fruits achenes, cylindric, quadrangular in section, slight bended at bottom, whitish crest 5-7 mm long, bristles rough, 2.8-3.2 x 0.5-0.7 mm.**

**Surface longitudinal ribbed and furrowed, slight lustrous, blackish-brown or black. 2n = 27.** Native to Europe, light woods and shrubberies, forest margins, overgrown rocks, on non-calcareous grounds. Br, Mo, Pl, Ro, Uk.

**3879. *Pilosella alpicola*** (Schleich. ex Gaudin) F. W. Schultz et Sch.-Bip., *Hieracium alpicola* Schleich. ex Gaudin – Perennial, flowering stems 5-25 cm high, shootless, stellate hairy, leaves in basal rosette. **Fruits achenes, cylindric, white crest, 1.5-2x longer than the achene, bristles rough, 1.6-1.8 x c. 0.5 mm. Surface longitudinal ribbed, smooth, lustreless, black. 2n = 36.** Native to central Europe, stony and grassy mountain meadows, pastures, overgrown rocks and screes of subalpine and alpine zones. Pl, Ro, Sk.

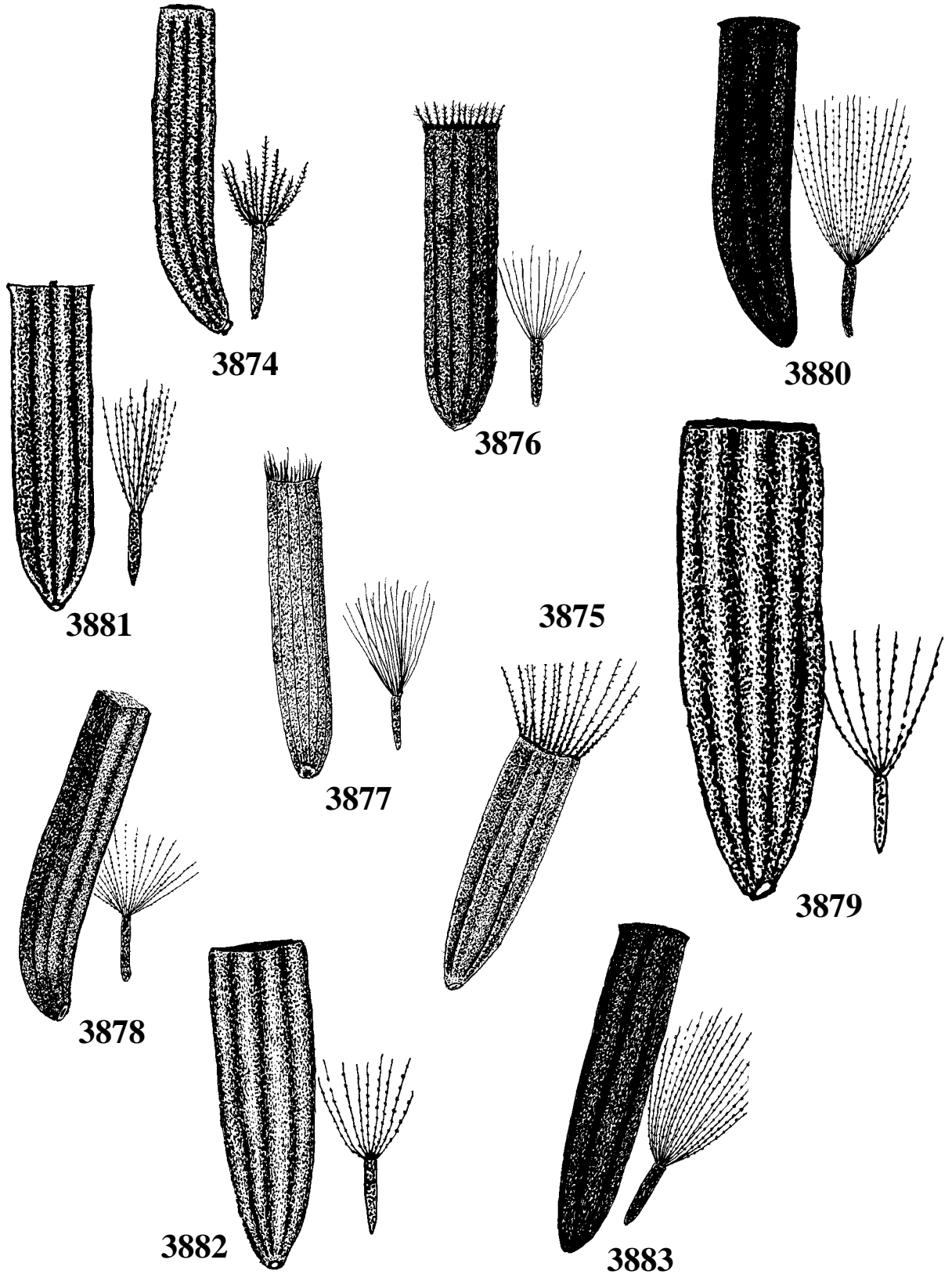
**3880. *Pilosella aurantiaca*** (L.) F. W. Schultz et Sch.-Bip., *Hieracium aurantiacum* L. – Perennial, flowering stem 20-40 cm high, scarcely starlike hirsute, basal rosette from 3-5 leaves with numerous above-ground shoots. **Fruits achenes, cylindric, white crest 2x longer than the achene, bristles rough, 1.8-2 x 0.4-0.5 mm. Surface longitudinal ribbed and furrowed, glabrous, lustreless, black. 2n = 18, 27, 36, 45, 63, 72.** Native to Europe (Alps and Carpathians), meadows, pastures, mountain meadows, grassy clearings of forests and dwarf pine areas, often cultivated in gardens and parks. Pl, Ro, Sk, Uk.

**3881. *Pilosella bauhinii*** (F. W. Schultz ex Besser) Arv.-Touv., *Hieracium bauhinii* F. W. Schultz ex Besser – Perennial, shoots long emerging from leaf armpit of basal rosette, stems 50-60 cm high, bare. **Fruits achenes, cylindric, white crest, 1.5x longer than the achene, bristles fine rough, 1.9-2.1 x 0.4-0.5 mm. Surface longitudinal ribbed, glabrous, slight lustrous, black. 2n = 36, 45.** Native to Europe, sunny and grassy slopes, steppe hills of warmer areas. Hu, Pl, Ro, Sk.

**3882. *Pilosella caespitosa*** (Dumort.) P. D. Sell et C. West, *Hieracium pratense* Tausch – Perennial, stems 30-80 cm high, with some lateral twigs and numerous flower heads. **Fruits achenes, cylindric, white crest as long as or a little longer than the achene, bristles rough, 1.5-1.9 x c. 0.5 mm. Surface longitudinal ribbed, glabrous, slight lustrous, black. 2n = 45.** Native to Eurasia, grassy overgrown places, meadows, pastures of warmer and dryer areas. Hu, Pl, Ro, Sk.

**3883. *Pilosella cymosa*** (L.) F. W. Schultz et Sch.-Bip., *Hieracium cymosum* L. – Perennial, shoots short,





stem 40-60 cm high with numerous (20-50) capitulum. **Fruits achenes, cylindric, white crest 1.5x longer than the achene, bristles rough, 1.8-2 x c. 0.4 mm. Surface longitudinal ribbed, glabrous, slight lustrous, black.  $2n = 36$ .** Native to Europe, sunny stony slopes, pastures, dryer meadows, boundaries and forest margins of warmer areas. Hu, Pl, Ro, Sk, Uk.

**3884. *Pilosella echioides*** (Lumn.) F. W. Schultz et Sch.-Bip., *Hieracium echioides* Lumn. — Perennial, stem 25-90 cm high, densely starlike bristly hirsute, basal rosette shootless. **Fruits achenes, cylindric, apex with whitish crest 1.5x longer than the achene, bristles rough, 2.1-2.3 x 0.4-0.5 mm. Surface longitudinal ribbed and furrowed, smooth, lustreless, black.  $2n = 36$ .** Native to Eurasia, sunny and dry rocks, grassy and stony sunny slopes, sandy pine forests in the warmest areas of the Carpathians. Au, Br, Hu, Pl, Ro, Sk, Uk.

**3885. *Pilosella flagellaris*** (Willd.) P. D. Sell et C. West, *Hieracium flagellare* Willd. — Perennial, stems up to 40 cm high, with 2-7 capitulum and numerous 2-3 mm long hairs. **Fruits achenes, cylindric, white crest with rough bristles, 2.3-2.5 x 0.5-0.6 mm. Surface longitudinal ribbed, smooth, slight lustrous, black.  $2n = 36, 45$ .** Native to Europe, pastures and mountain meadows. Hu, Pl, Ro, Sk, Uk.

**3886. *Pilosella lactucella*** (Wallr.) P. D. Sell et C. West, *Hieracium lactucella* Wallr. — Perennial, stems numerous, 10-40 cm high, erect, with shovel-like leaves. **Fruits achenes, cylindric, whitish crest 2x longer than the achene, bristles rough, bended at bottom, 1.8-2.2 x 0.5-0.6 mm. Surface longitudinal ribbed, smooth, slight lustrous, black.  $2n = 18$ .** Native to Europe, moist grassy places, peatbog margins, boundaries, pastures. Ro, Sk.

**3887. *Pilosella macrantha*** (Ten.) F. W. Schultz et Sch.-Bip., *Hieracium macranthum* (Ten.) Ten. — Perennial, stems rough, up to 40 cm high, each with a single capitulum, with numerous simple and glandular hairs. **Fruits achenes, cylindric, apex with white crest, 2x as long as the achene, 2-2.2 x 0.3-0.4 mm. Surface longitudinal ribbed, slight lustrous, blackish to black.  $2n = 18$ .** Native to the Alps and the Carpathians, grassy alpine meadows and pastures, light shrubberies. Hu, Ro, Sk.

**3888. *Pilosella officinarum*** F. W. Schultz et Sch.-Bip., *Hieracium pilosella* L. — Perennial, stem

5-50 cm high with simple and starlike glandular hairs, with terminal capitulum on stem. **Fruits achenes, cylindric, whitish crest a little longer than the achene, 2.1-2.3 x c. 0.5 mm. Surface longitudinal ribbed, lustreless, brownish-black or black.  $2n = 36$ .** Native to Eurasia, dryer grassy, sandy and stony overgrowths on non-calcareous and acid soils. Hu, Pl, Sk.

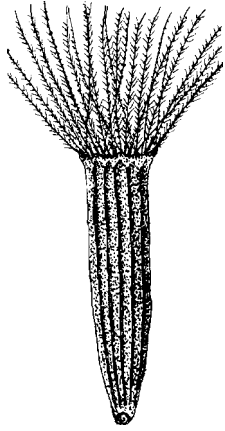
**3889. *Pilosella piloselloides*** (Vill.) Soják, *Hieracium piloselloides* Vill. — Perennial, stems 15-50 cm high, erect, bare, sometimes with glandular and simple hairs, inflorescence broomy, with 10-20 capitulum. **Fruits achenes, cylindric, apex with whitish crest, 1.5-2x as long as the achene, 1.6-1.8 x c. 0.4 mm. Surface longitudinal ribbed and furrowed, lustrous, black.  $2n = 36$ .** Native to Europe, ruderal stands, sunny, grassy and shrubby slopes. Hu, Pl, Ro, Sk, Uk.

**3890. *Pilosella polonicum*** Blocki, *P. onegense* (Norrl.) Norrl. — Perennial, stems 30-70 cm high, leaves from both sides densely covered with 0.3-1 mm long hairs. **Fruits achenes, cylindric, apex with white crest, 2x as long as the achene, 1.7-1.9 x c. 0.4 mm. Surface longitudinal furrowed and ribbed, glabrous, slight lustrous, brownish-black to black.** Native to Europe, mountain woodland clearings, meadows and moorlands. Br, Pl, Uk.

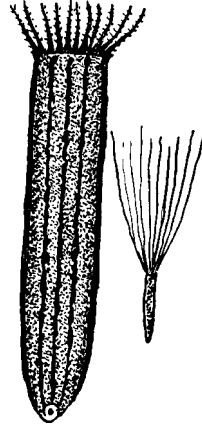
**3891. *Pilosella praealta*** (Vill. ex Gochnat) F. W. Schultz et Sch.-Bip., *Hieracium praealtum* Vill. ex Gochnat — Perennial, stems bare or starlike hirsute, shootless, leaves in basal rosette. **Fruits achenes, cylindric, bristles of whitish crest rough, 1.6-1.8 x 0.3-0.4 mm. Surface longitudinal ribbed, glabrous, slight lustrous, black.  $2n = 45$ .** Native to Europe, stony slopes, sunny pastures, overgrown reinforced screes. Mo, Ro, Sk, Uk.

## 154. BUTOMACEAE

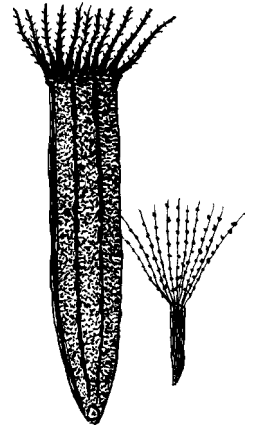
**3892. *Butomus umbellatus*** L. — Perennial, a water plant, stem leafless, angular at the top, erect, 50-140 cm high, false umbel of flowers, leaves in basal rosette. **Seeds, lateral flattish, cylindric, with 3 longitudinal ribs, winged on dorsal side, 1.6-2 x 0.5-0.6 mm. Surface fine granular, lustrous, dark-brown, wing pale-brown.  $2n = 26, 39$ .** Native to Eurasia, growing in shallow stagnant waters, on banks of still or slow-flowing waters in warm situations; in all Carpathian territories.



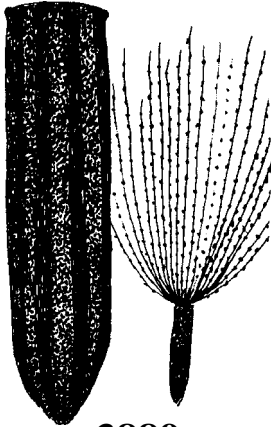
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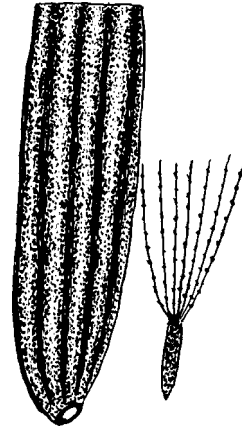
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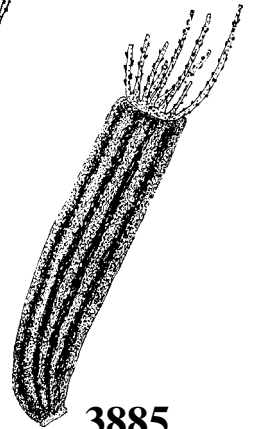
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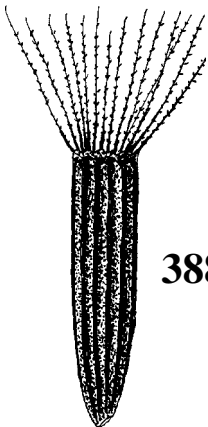
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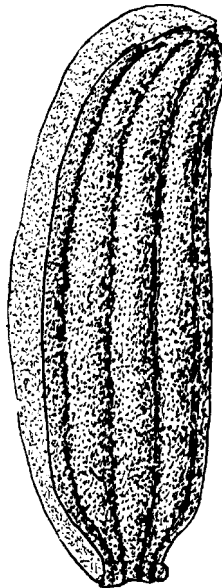
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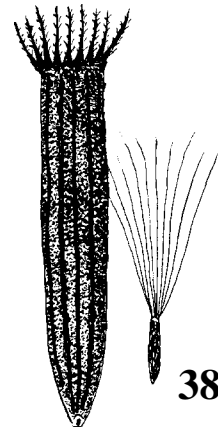
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## 155. HYDROCHARITACEAE

**3893. *Stratiotes aloides* L.** — Perennial, stem short, thick, sprouted floating shoots near water surface in flowering time. **Seeds, semicylindric, dorsal side raised, glabrous, ventral side flat, longitudinal striate, stalk blackish at bottom, 7-9 x 1.9-2.2 mm. Surface smooth, lustrous, pale-orange. 2n = 24 (40).** Native to Euro-Siberia, thriving in water pits, swamps, dead arms of larger rivers; in all Carpathian regions.

**3894. *Hydrocharis morsus-ranae* L.** — Perennial, water plant, rhizome short with long shoots, with leaf-rosette on top, flower stems 1-6 cm high, simple. **Seeds, conical or oval, wrapped in semitransparent cover, 1.8-2.2 x 0.8-1 mm. Cover surface dirty-white, that of proper seed undulated, lustrous, blackish. 2n = 28.** Native to Eurasia, thriving in stagnant, usually shallow warm waters shaded in summer; in all Carpathian territories.

## 156. SCHEUCHZERIACEAE

**3895. *Scheuchzeria palustris* L.** — Perennial, stems erect, 10-20 cm high,  $\pm$  non-branched, leafy. **Seeds, cylindric or oval, round in section, apex and bottom rounded, 3.8-4.2 x 2.1-2.3 mm. Surface glabrous, lustrous, yellowish- or pale-brown. 2n = 22.** Native to Eurasia and North America, transient peatbogs, muddy sites of warm areas. Br, Pl, Ro, Sk, Uk.

## 157. ALISMATACEAE

**3896. *Sagittaria latifolia* Willd.** — Perennial, dioecious or monoecious, robust, up to 1 m high, aerial leaves sagittate with 2 long, acute basal lobes, flowers in racemes or panicles. **Fruits achenes, obovate, with  $\pm$  elongated, horizontal, ventral beak, margin winged, 3.4-4 x 3.4-3.8 mm. Surface waved, faint lustrous, light-brown.** Native to North America, naturalized in various parts of Europe, boggy places, strongly alkaline stands. Ro.

**3897. *Sagittaria sagittifolia* L.** — Perennial, stem triangular, erect, submerged leaves linear, these emerging from water broad-arrowed. **Fruits achenes, obconic or obovate, strong compressed, apical short-beak, broad winged, 5-6 x 3.5-4 mm. Surface longitudinal striate, with pale rib in the middle, lustrous, brown, wing pale-brown. 2n = 22.** Native to Eurasia, river of slow-flowing or stagnant waters or lake-sides; in all Carpathian territories.

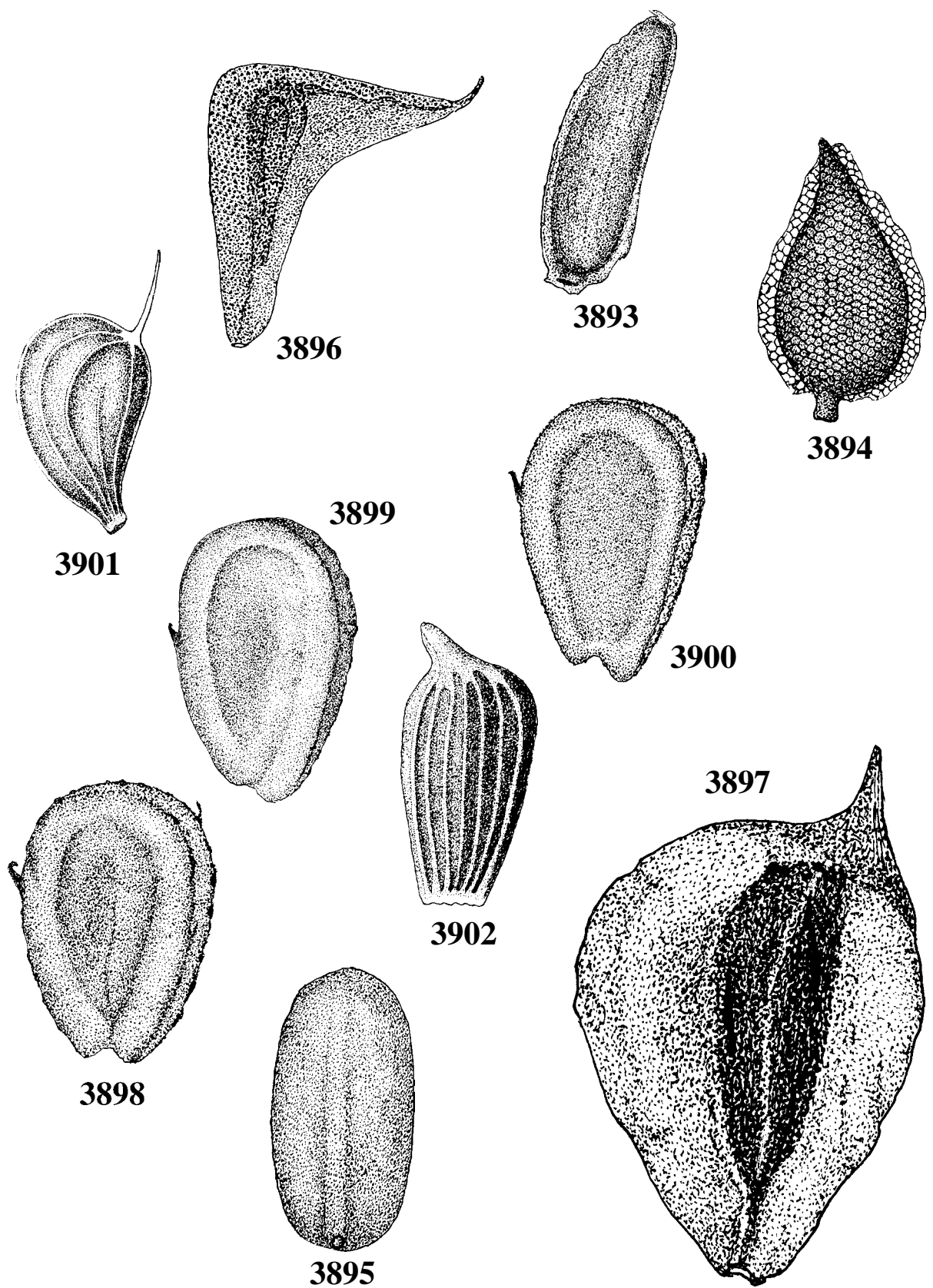
**3898. *Alisma gramineum* Lej., *A. angustifolium* Opiz, *A. loeselii* Gorski** — Perennial, stems 10-30 cm high, leaves in water narrowly and longly linear, those above the water surface ellipsoidal. **Fruits achenes, obovate, lateral compressed, pericarp thick, transparent, dorsal side with longitudinal groove, small incurved ventral beak, 2.3-2.8 x 1.3-1.7 mm. Surface longitudinal very fine-striate, dull, pale-brown. 2n = 14.** Native to circumpolar territories, banks of eutrophic reservoirs and shallow, stagnant or slow-flowing waters; in all Carpathian territories.

**3899. *Alisma lanceolatum* With., *A. longifolium* J. Presl** — Perennial, stems erect, 15-20 cm high, upper half whorledly ramified into flower-bearing twigs. **Fruits achenes, obovate, lateral compressed, pericarp thick, transparent, with two longitudinal grooves on dorsal side, apex round, bottom narrowed, small incurved ventral beak, margin winged, 2.5-3.1 x 1.6-2 mm. Surface very fine longitudinal striate, lustrous, pale-brown. 2n = 26.** Native to Eurasia, in deeper, still waters, reed swamps; throughout the Carpathians.

**3900. *Alisma plantago-aquatica* L.** — Perennial, stems erect, 80-120 cm high, upper half whorledly ramified into flower-bearing twigs. **Fruits achenes, obovate or horseshoe, lateral compressed, pericarp thick, apex round, bottom narrowed, small ventral beak, margin winged, 2-2.5 x 1.1-1.3 mm. Surface longitudinal very fine striate, lustrous, pale-brown. 2n = 14.** Native to Eurasia, muddy banks of stagnant waters, water pits, ponds and emerged banks; in all Carpathian regions.

**3901. *Caldesia parnassifolia* (L.) Parl., *Alisma parnassifolium* L.** — Perennial, stems 10-50 cm long, all leaves basal, floating or aerial, ovate to elliptical, cordate or subcordate, flowers in racemes or panicles. **Fruits achenes, obovate, drupaceous, with 3-5 longitudinal ribs on dorsal side, with woody endocarp, spongy exocarp and a short subventral beak, 3-3.8 x 1.8-2.2 mm. Surface smooth, brown. 2n = 22.** Native to Eurasia, boggy stands and water reservoirs, lakes. Br, Hu, Pl, Ro, Uk.

**3902. *Elisma natans* (L.) Buchenau, *Alisma natans* L., *Luronium natans* (L.) Rafin.** — Perennial, stems leafy, submerged, basal leaves sessile, linear, 5-10 cm x 2-3 mm. **Fruits achenes, ovate, apex truncate,**



apical curved beak, bottom  $\pm$  round, 2.8-3.2 x 1.3-1.5 mm. Surface longitudinal ribbed (12-15 ribs) and furrowed. Native to central Europe and coasts of the Atlantic Ocean. Mo, Pl, Ro (?).

**3903. *Baldellia ranunculoides*** (L.) Parl., *Echinodorus ranunculoides* (L.) Engelm., *Alisma ranunculoides* L. — Perennial, stems short or with elongated, decumbent branches, bearing rosettes of leaves with axillary flowers. **Fruits achenes, oblique or narrow obovate, beaked on apex, 2.7-3.3 x 1.2-1.6 mm. Surface sometimes pubescent.  $2n = 16, 30$ .** Native to western, southern and central Europe. Br, Pl.

### 158. JUNCAGINACEAE

**3904. *Triglochin maritima*** L. — Perennial, stem 10-60 cm high, flower cluster, erect, dense, narrow, flower stalks 1-4 mm. **Fruits achenes, prolonged cylindric, depressed on dorsal side into groove, ventral side rooflike with longitudinal rib, apex narrowed into rest of the style, round at base, 3.9-4.5 x 0.8-1 mm. Surface fine longitudinal striate, dull, pale-brown.  $2n = 48$ .** Native to boreal-circumpolar territories; in all Carpathian regions.

**3905. *Triglochin palustre*** L. — Perennial, stem 10-30 cm high, leaves narrowly linear. **Fruits achenes, prolonged lanceolate, narrowed at base into short stalk, 5.5-6.5 x 0.8-1 mm. Surface longitudinal striate, dull, pale-brown.  $2n = 24$ .** Native to arctic-circumpolar territories, swampy meadows, drying up fenlands, saline soils, springheads, on basic up to acid soils; throughout the Carpathians.

### 159. POTAMOGETONACEAE

**3906. *Potamogeton acutifolius*** Link, *P. cuspidatus* Schrad. — Perennial, stems considerably compressed, richly ramified, all leaves submerged. **Fruits achenes, semiglobular with broad keel on lateral side, lateral compressed, 3.2-3.8 x 2.4-2.8 mm. Surface slight wrinkly, dull, dirty-brown.  $2n = 26$ .** Native to Europe, stagnant or still-flowing, but eutrophic waters, often calcareous with muddy, 30-150 cm deep bottoms: ponds, water pits, dead river arms. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**3907. *Potamogeton alpinus*** Balb., *P. purpurascens* Seidl ex J. et C. Presl — Perennial, stems and leaves often purplish, stems up to 200 cm long, submerged leaves lanceolate. **Fruits achenes, elliptic to obovoid, slight compressed, dorsal side with keel, short,**

**slight abaxially curved beak 0.5-0.9 mm long, 3-4 x 2-2.4 mm. Surface glabrous, dull, dirty-white.  $2n = 52$ .** Native to boreal-circumpolar territories, cool, stagnant or slow-flowing oligotrophic waters with sandy or muddy bottoms. Br, Pl, Ro, Sk, Uk.

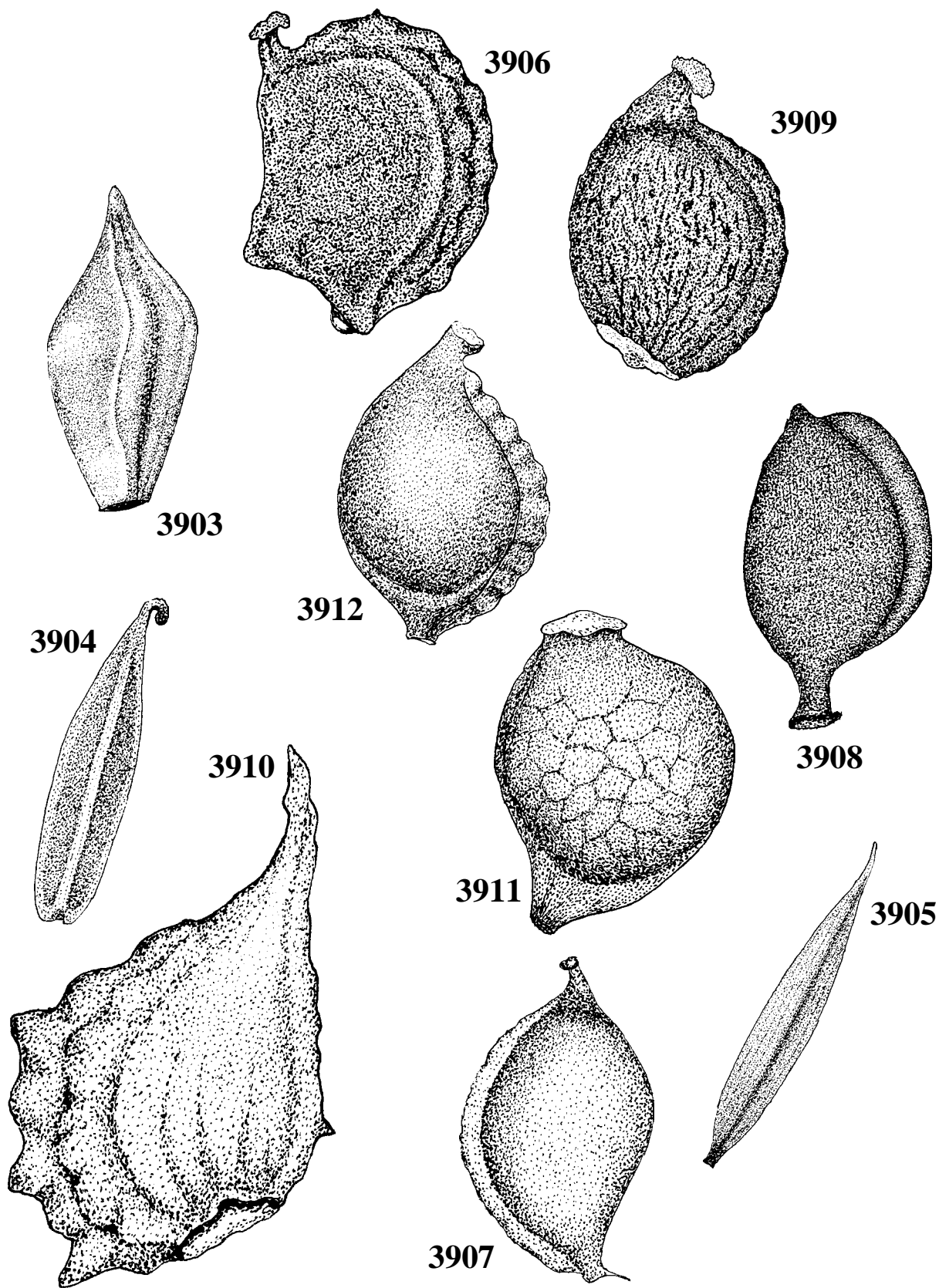
**3908. *Potamogeton berchtoldii*** Fieber, *P. pusillus* auct. non L. — Perennial, stems 30-80 cm long, much branched at base, leaves submerged, linear 15-50 x 0.5-2 mm. **Fruits achenes, elliptic to ovoid, lateral compressed above, with distinct keel at one side, 2-2.5 x 1.2-1.4 mm. Surface low-tuberculate, lustreless, pale-greyish.  $2n = 26$ .** Native to Europe, stagnant waters, ponds, water ditches and blind arms; all over the Carpathians.

**3909. *Potamogeton compressus*** L., *P. zosterifolius* Schumacher — Perennial, stems strongly compressed, branched, leaves all submerged, 2-4 mm wide, mucronate, spikes few-flowered. **Fruits achenes, semirounded fruitlets with a narrower ventral keel from apex towards the base, slight compressed, apical slight curved beak, 3-6-4.4 x 2.2-2.8 mm. Surface longitudinal disconnected, wrinkly, dull, greenish to brown.  $2n = 26$ .** Native to Europe, in stagnant waters, ponds, water ditches, blind arms. Pl, Ro, Sk, Uk.

**3910. *Potamogeton crispus*** L., *P. serratus* auct. non L.: Huds. — Perennial, rhizome thin, creeping, branched, stems simple up to richly ramified, 20-200 cm long. **Fruits achenes, globular or ovoid, abaxially and laterally rounded, dorsal side convex, ventral side rooflike, beak on apex straight or apically recurved, 2.5-3 mm long, 5-5.6 x 2.9-3.3 mm. Surface warty on dorsal side, glabrous, dull, red brown to dark-brown.  $2n = (26) 52$ .** Native to Eurasia, stagnant eutrophic waters of pools, water-pits and dead river arms in all Carpathian territories.

**3911. *Potamogeton filiformis*** Pers. — Perennial, stems compressed, 2-canalicular, leaves submerged, sessile, 1-1.5 mm wide, obtuse or rounded, spikes widely interrupted. **Fruits achenes,  $\pm$  spherical, apex with a very short, verruciform, subapical beak, 2.2-2.6 x 1.6-1.8 mm. Surface shallow reticulate, faint lustrous, brown.  $2n = 78$ .** Native to northern Europe and the Alps, mainly near seas, often in brackish waters. Br, Hu, Mo, Pl.

**3912. *Potamogeton friesii*** Rupr., *P. mucronatus* Schrader ex Sonder — Perennial, rhizome absent, stems 80-140 cm long, strongly compressed, lateral



branches compressed and strongly ribbed at the base. **Fruits achenes, ovoid, lateral compressed, apex with beak, with wavy keel on ventral side, 2.5-3 x 1.6-1.8 mm. Surface glabrous, faint lustrous, pale-brown. 2n = 26.** Native to central and southern Europe, lakes and standing river-waters. Br, Mo, Pl, Ro (?), Uk.

**3913. *Potamogeton lucens* L.** — Perennial, stems 20-200 cm long, richly ramified, all leaves submerged, membranous, transparent. **Fruits achenes, semirounded or obovoid, keeled on ventral side, with rest of the style at apex, with rest of the stalk at bottom, 3.3-3.7 x 2.5-2.7 mm. Surface wrinkly or verrucose, dull, greenish-brown. 2n = 52.** Native to Eurasia, deeper, stagnant or free-flowing, eutrophic, basic, nourishment-rich waters with humous, muddy bottoms; in all Carpathian territories.

**3914. *Potamogeton natans* L.** — Perennial, stems up to 1 m long, spring leaves submerged, summer leaves floating on water. **Fruits achenes, oval or ellipsoid with blunt beak at apex and rest of the stalk at base, 3.4-3.8 x 2.1-2.4 mm. Surface glabrous, wrinkly, lustrous, yellowish-brown. 2n = 52.** Native to boreal-circumpolar territories, stagnant waters, ponds, water pits, dead arms, rare in slow-flowing or peatboggy waters, with muddy bottoms; throughout the Carpathians.

**3915. *Potamogeton nodosus* Poir., *P. petiolaris* C. Presl** — Perennial, stems 100-180 cm long, submerged leaves stalky. **Fruits achenes, semirounded or obovoid, abaxially keeled on dorsal side, keel well developed, laterally ridged, lateral ridges with blunt to sharp points, beak erect, 2.7-4.3 x 2.3-3 mm. Surface wrinkly, sides without basal tubercles dull, red to reddish- or greenish-brown. 2n = 52.**

**3916. *Potamogeton obtusifolius* Mert. et W. D. J. Koch** — Perennial, stems weakly compressed, simple or richly branched above, all leaves submerged. **Fruits achenes, semiglobular, lateral compressed, abaxially keeled on dorsal side, laterally keeled, lateral keels without points, apex beak erect 0.8-1 mm long, 3.1-4 x 2.3-2.7 mm. Surface longitudinal wrinkly, sides without basal tubercles, dull, olive-green to brown. 2n = 26.** Native to boreal-circumpolar territories, usually in stagnant, seldom in flowing, non-calcareous, eutrophic waters, with

humous, muddy bottoms: ponds, ditches, water pits. Br, Cz, Hu, Pl, Ro, Sk, Uk.

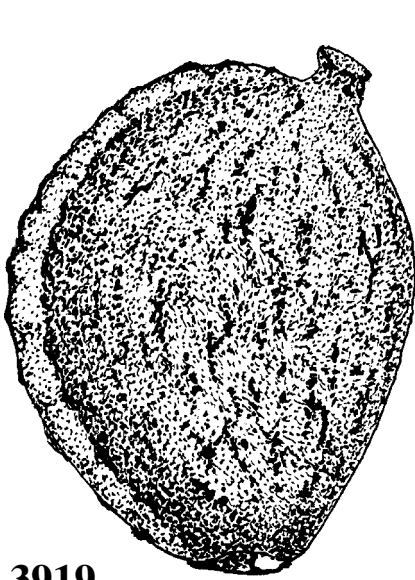
**3917. *Potamogeton pectinatus* L. *Coleogeton pectinatus* (L.) Dostál** — Perennial, water plant, creating circular colonies on water-surface, stems 50-400 cm long, richly branched, stems internodes 2-10 cm long. **Fruits achenes, broad semiglobular or obovoid, abaxially keeled on dorsal side, apex with beak (rest of the style), 3.4-4.4 x 2.6-3.4 mm. Surface wrinkly, slight lustrous, yellowish-brown. 2n = 78.** Native to Eurasia (now a cosmopolitan) in eutrophic warm water reservoirs, stagnant or slowly flowing waters, ditches, ponds. blind arms. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**3918. *Potamogeton perfoliatus* L., *P. amplexicaulis* Kar.** — Perennial, stems richly ramified, numerous clasping leaves cordate, all submerged. **Fruits achenes, semiglobular or obovoid, slight compressed, turgid or rarely concave, abaxially rounded, laterally rounded, not abaxially or laterally keeled, apex with erect beak 0.4-0.6 mm long, bottom with small thorn and semitransparent comblet on dorsal side, 1.6-3.2 x 1.3-2.3 mm. Surface glabrous, sides without basal tubercles, lustreless, greenish brown to olive-green or pale-grey. 2n = 52.** Native to boreal-circumpolar territories, stagnant or free-flowing, subtropic, basic, nourishment-rich waters, with humous and muddy bottoms: ditches, ponds, water pits; in all Carpathian regions.

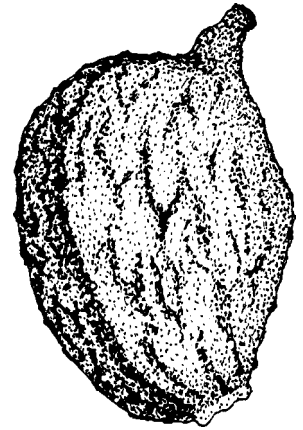
**3919. *Potamogeton polygonifolius* Pourr., *P. oblongus* Viv.** — Perennial, stem hardly of 2 mm in diam., short, leaves lanceolate, submerged. **Fruits achenes, rounded or oval, slight compressed, abaxially keeled on dorsal side, keel narrow, apex with very short beak, bottom with whitish hilum, 2.1-2.5 x 1.7-1.9 mm. Surface wrinkly, dull, reddish-brown. 2n = 26.** Native to Europe, shallow water pits with sandy or muddy bottoms. Pl.

**3920. *Potamogeton praelongus* Wulf.** — Perennial, stems 20-150 cm long, ramified above, twigs undulated, all leaves submerged, lanceolate. **Fruits achenes, semispherical or obovoid, lateral compressed, turgid, abaxially keeled on dorsal side, occasionally laterally keeled, lateral keels when present without points, beak erect 0.6-1 mm long, 4-6 x 3.2-4 mm. Surface very fine striate, sides without basal tubercles, dull, greenish brown or grey. 2n = 52.** Native to boreal-circumpolar

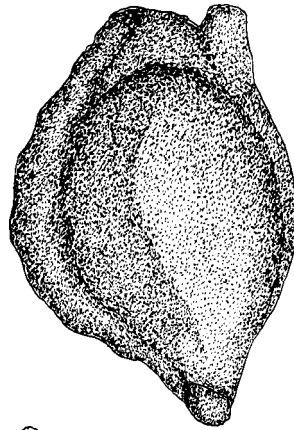




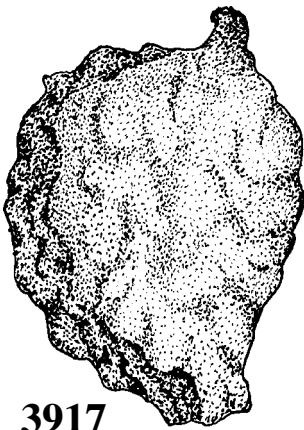
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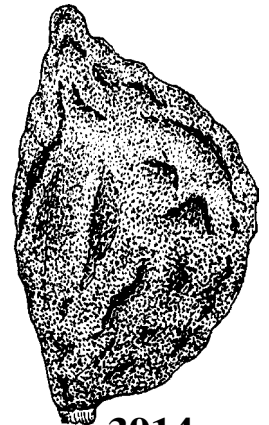
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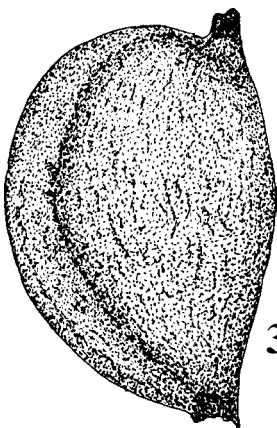
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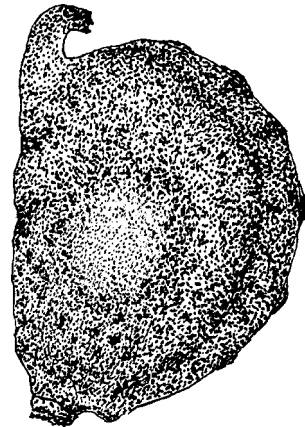
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territories, clear, quiet- or still-flowing, mezzotrophic waters with humous, sandy or muddy, 50-80 cm deep bottoms. Br, Mo, Pl, Uk.

**3921. *Potamogeton pusillus* L., *P. berchtoldii* Fieber, *P. panormitanus* Biv.** — Perennial, stems articulate, 15-80 cm high, internodes 1.5-7 cm long. **Fruits achenes, aslant-ovoid to obovoid, turgid to concave, abaxially rounded, laterally rounded, dorsal with narrow suture, ventral side with plump raphe, not abaxially or laterally keeled, apex with erect beak, 0.1-0.6 mm long, 1.5-2.2 x 1.2-1.6 mm. Surface smooth, tubercles absent, dull, green or greenish-grey to brown.  $2n = 26$ .** Native to boreal-circumpolar territories, pond stagnant waters, water pits, blind arms, eutrophic, in summer warming up waters; in all Carpathian territories.

**3922. *Potamogeton rutilus* Wulf.** — Perennial, rhizome absent, winter-buds terminating lateral branches, strongly ribbed at base, stems 20-40 cm long. **Fruits achenes,  $\pm$  oval or ovoid, lateral compressed, dorsal side abaxially keeled, with beak on apex, 2-2.5 x 1.4-1.6 mm. Surface glabrous, lustreless, brown.  $2n = 26$ .** Native to northern central and eastern Europe, very common in lakes and standing waters, rarely in boundaries and rivers. Br, Mo, Ro (?), Uk.

**3923. *Potamogeton trichoides* Cham. et Schlecht., *P. condylocarpus* Tausch** — Perennial, stems very thin, fragile, semiundulated, richly ramified from base. **Fruits achenes, semiglobular, lateral compressed, with distinct or indistinct keel on dorsal side, apex with erect beak, 2.3-2.8 x 1.6-1.8 mm. Surface wrinkly, keel with tubercles, dull, green or greenish-brown.  $2n = 26$ .** Native to Eurasia, stagnant mezzotrophic, basic to acid waters, with sandy or peaty bottoms, dead arms, ponds, water pits; in all Carpathian territories.

**3924. *Groelandia densa* (L.) Fourr., *Potamogeton densus* L.** — Annual to perennial, water plant, stems cylindric, dichotomic ramified, up to 60 cm long, internodes 1-6 cm long. **Fruits achenes, spherical, lateral compressed, abaxially keeled, apex with hook-like beak, 2.8-3.2 x 2-2.4 mm. Surface verrucose, dull, pale- or dark-greyish.  $2n = 30$ .** Native to Eurasia, slowly flowing, cool and clean, 20-100 cm deep waters, brook and ditches with humous, sandy or stony bottoms. Hu, Pl, Ro, Sk.

## 160. RUPPIACEAE

**3925. *Ruppia maritima* L., *R. rostellata* Koch** — Perennial, submerged herbs of saline waters, stems tender, branched, 10-100 cm long, leaves alternate, linear, less than 1 mm wide. **Fruits achenes, aslant ovoid, often crooked, without endosperm, apex with beak, bottom with long stalk, 2-3 x 1.4-1.8 mm. Surface long or short stipitate, smooth, pergameneous.  $2n = 20$  (40).** A cosmopolitan thriving in clean, saline, semisalinity and stagnant waters, usually near the sea; in all Carpathian countries, except Hu, Ro, Uk.

## 161. ZOSTERACEAE

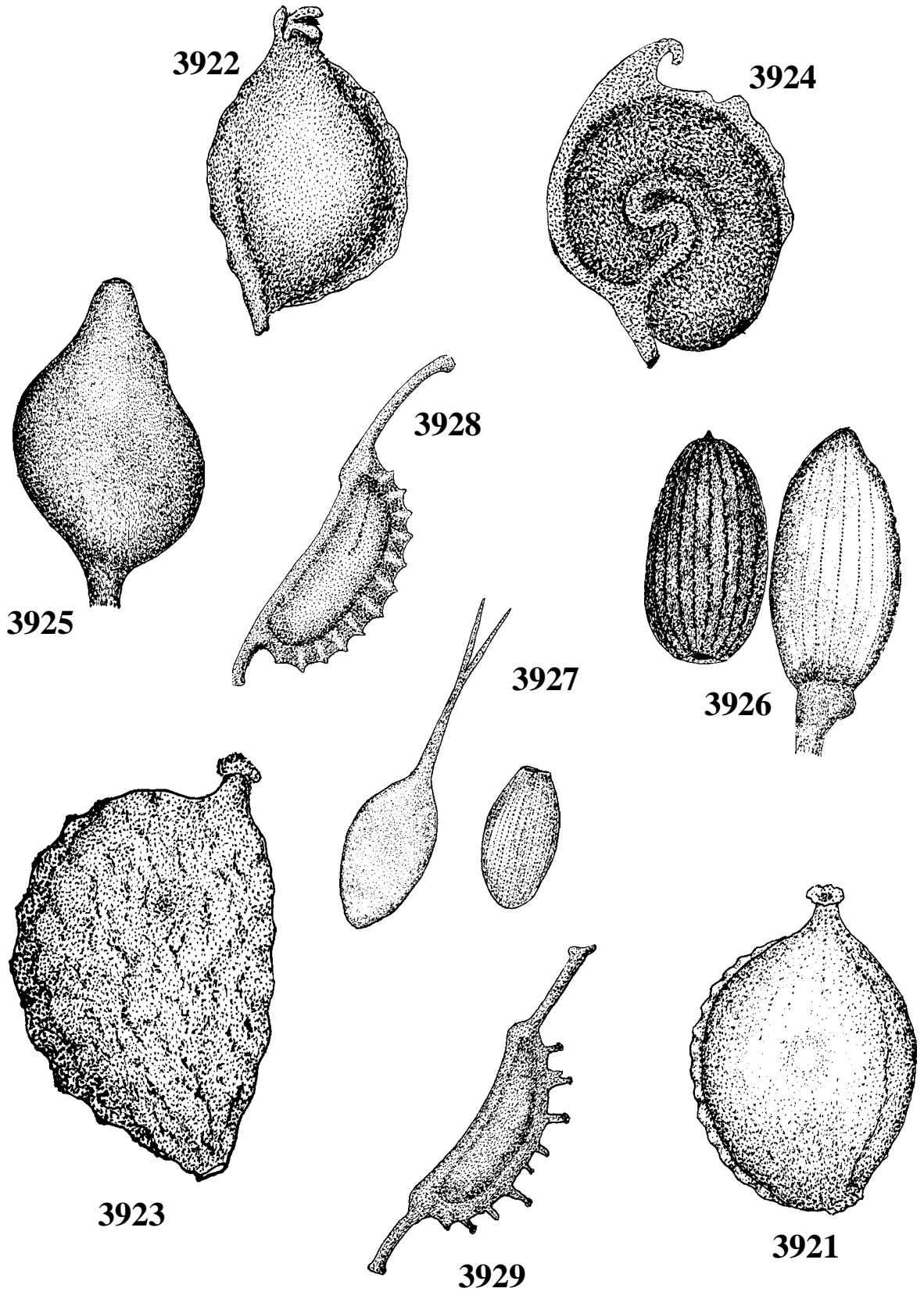
**3926. *Zostera marina* L.** — Perennial, submerged marine herbs, short shoots with several distichous, linear leaves with compressed, sheathing bases, flowering stems lateral or terminal, 80-150 cm high, much branched. **Fruits achenes, ellipsoid, longitudinal indistinct furrowed, 4-4.8 x 1.7-1.9 mm. Seeds a little smaller, with beak at apex and depressed hilum at bottom, 3-3.5 x 1.6-1.8 mm. Surface longitudinal furrowed, faint lustrous, brown.  $2n = 12$ .** Native to coasts of nearly whole Europe. Pl, Ro, Uk.

**3927. *Zostera noltii* Hornem., *Z. minor* Nolte ex Rchb., *Z. nana* Roth p. p.** — Perennial, flowering stems usually c. 10 cm high, lateral, simple or sparingly branched. **Fruits achenes, ellipsoid, with long beak on apex, 4.5-5.5 x 1.1-1.4 mm (with beak). Seeds longitudinal shallow furrowed, with rounded hilum at bottom, 1.8-2.2 x 1-1.2 mm.  $2n = 12$ .** Native to coasts of Europe, on mud in sheltered habitats, and in shallow waters in non-tidal saline habitats. Pl, Ro, Uk.

## 162. ZANNICHELLIACEAE

**3928. *Zannichellia palustris* L., *Z. pedunculata* Rchb.** — Perennial, aquatic, stems up to 50 cm long, slender, creeping below, rooting down at knots, much branched, flowers axillar. **Fruits achenes, seated or short stalked, stipitate or subsessile, planoconvex, lateral compressed, often curved, laterally crenate-dentate, beaked, 5.4-6.2 x 1.3-1.6 mm. Surface fine verrucose, lustreless, greyish-brown.  $2n = 36$ .** A cosmopolitan, except Australia, in shallow, stagnant, eutrophic waters with muddy, basic, nourishing bottoms; in warmer areas of the whole Carpathians.

**3929. *Zannichellia pedicellata* (Wahlenb. et Rosén) Fries** — Perennial, vegetatively the same as *Z. palustris*, leaves 0.3-1.2 mm wide, differing only in



flower and fruit features. **Fruits achenes, seated or short stalked, planoconvex, lateral compressed and slight curved, papillose on dorsal side, beaked, 5.4-6.2 x 1.3-1.6 mm. Surface fine verrucose, lustreless, greyish-brown.  $2n = 24$ .** Scope of occurrence not known adequately, in saline waters, small water ditches, water boundaries, saline meadows; rare in all Carpathian regions.

### 163. NAJADACEAE

**3930. *Najas flexilis* (Willd.) Rostk.** — Annual, submerged, aquatic herbs, stems 10-70 cm long, male flowers with a spathe, female without it, leaves up to 3 cm x 1 mm, dentated. **Fruits achenes, spindleform, areolate, apex with beak, 3-4.5 x 1-1.3 mm. Seeds smooth, a little smaller than the fruits.  $2n = 24$ .** Native to North America, naturalized in northern and central Europe, only local. Br, Pl.

**3931. *Najas marina* L., *N. intermedia* Wolfg., *N. major* All.** — Annual, stems up to 50 cm high, sunken, stiff, forkedly ramified, lower article up to 10 cm long, upper one shorter. **Fruits achenes, prolonged obovoid, short keeled on apex, 6-7 x 2.8-3.3 mm. Seeds 5-6 x 2.3-2.7 mm. Surface foveolate, slight lustrous, greenish- or pinkish-brown.  $2n =$  male 12, female 13.** Native to circumpolar territories, in shallow, stagnant or slowly flowing, mezzotrophic to eutrophic waters, with sandy, humous or muddy bottoms. Br, Hu, Pl, Ro, Sk, Uk.

**3932. *Najas minor* All., *Caulinia fragilis* Willd.** — Annual, submerged, aquatic herbs, stems elongated up to 10-25 cm, dichotomic branched, flowers solitary. **Fruits achenes, cylindric in membranous cover. Seeds longitudinal slight striate, with transverse areoles (wider than longer), 2.5-3 x 0.4-0.5 mm. Surface brown.  $2n = 24$ .** Native to whole Europe, inclusive the Carpathians, stagnant and slowly flowing waters.

### 164. LILIACEAE

**3933. *Tofieldia calyculata* (L.) Wahlenb., *T. palustris* Huds., *Anthericum calyculatum* L.** — Perennial, stems erect, 10-45 cm high, with 1-3 leaves, the rest of leaves in basal rosette. **Seeds spindleform, ventral side with longitudinal furrow, 1-1.2 x 0.3-0.4 mm. Surface longitudinal fine striate, lustrous, reddish-brown.  $2n = 28$ .** Native to Europe, moor meadows, moist rocks, springheads, often on calcareous grounds. Br, Pl, Ro, Sk, Uk.

**3934. *Tofieldia pusilla* (F. Michx.) Pers., *T. borealis* Wahlenb.** — Perennial, stems 4-16 cm high, leafless, leaves in basal rosette. **Seeds triquetrous, dorsal side arcuate, ventral rooflike, 0.8-1 x 0.35-0.45 mm. Surface longitudinal fine striate, lustrous, reddish-brown.  $2n = 30$ .** Native to circumpolar territories, moist and wet rocks, snow-deck-chairs on basic grounds. Pl, Sk.

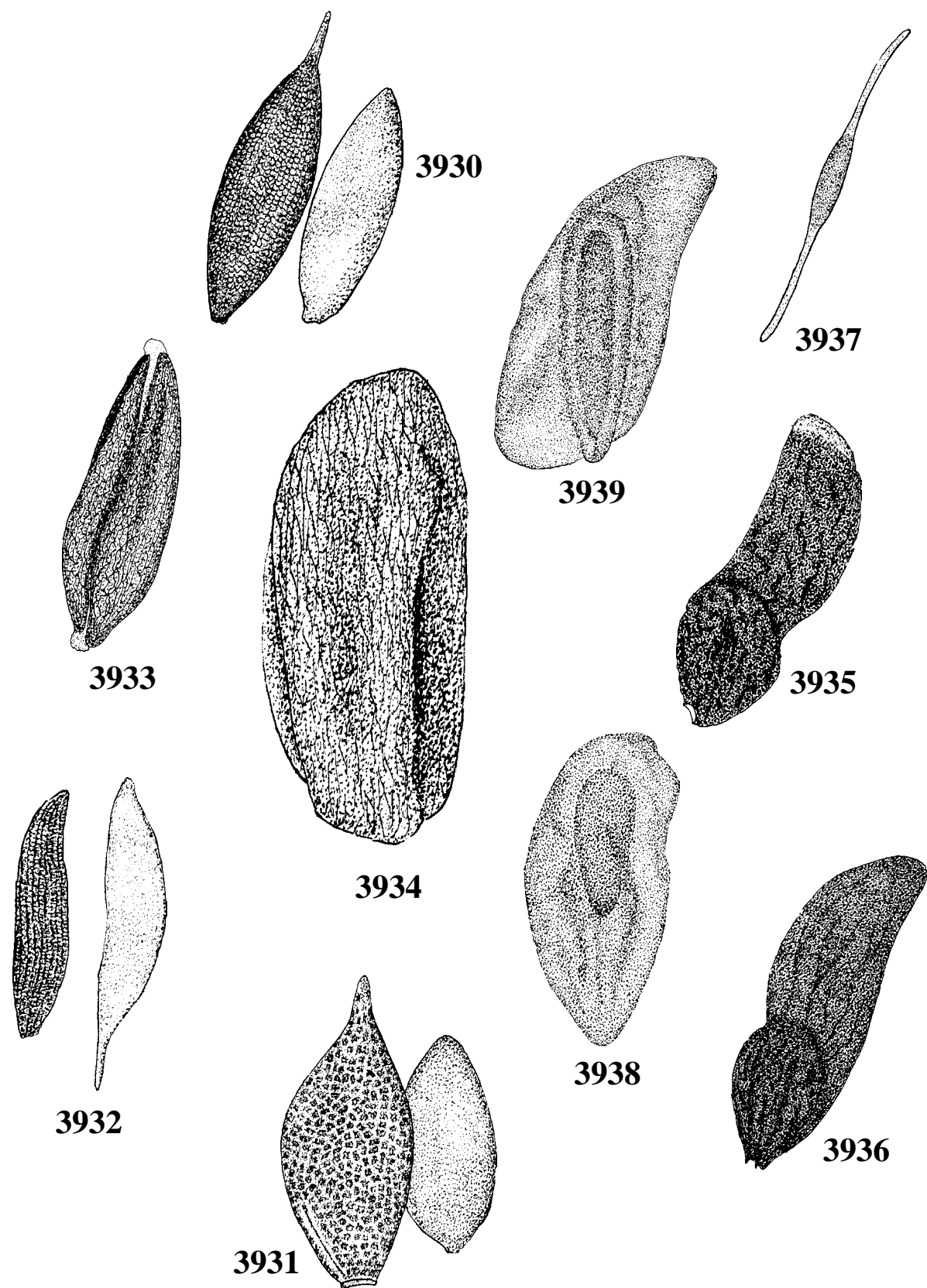
**3935. *Agapanthus africanus* (L.) Hoffmannsegg, *A. umbellatus* L' Hér., *Crinum africanum* L.** — Perennial, plant 30-200 cm high, basal leaves 10-40 cm long, inflorescence forming up to 50-100 flowers. **Seeds obovoid with broad wing, 9-11 x 3.3-3.7 mm. Surface wrinkly, dull, black.** Originally growing in southern Africa; introduced and rarely cultivated mostly in flowerpots in the Carpathians as a permanent decorative plant.

**3936. *Agapanthus praecox* Willd.** — Perennial, plant forming dense clumps, all leaves basal, evergreen, 20-70 x 15-55 mm, ligulate. **Seeds obovoid, lateral strong flattish, winged on apex, 10-12 x 3.7-4.3 mm. Surface wrinkly, lustrous, black.** Native to southern Africa; in the Carpathians rarely cultivated for ornament in gardens, in warmer areas, occasionally naturalized.

**3937. *Narthecium ossifragum* (L.) Huds.** — Perennial, stem stiff erect, 10-30 cm high, simple, with leafy sheaths at base, veiled. **Seeds numerous, thread-like, proper seeds makes hardly 1/3, 6.2-7 x 0.35-0.45 mm. Surface longitudinal fine striate, smooth, lustrous, whitish, the seeds yellowish.  $2n = 26$ .** Native to Europe, marshy fenlands; in the Carpathians rarely cultivated as ornamental in gardens.

**3938. *Veratrum album* L.** — Perennial, stems 50-70 cm high, cauline leaves glabrous or subglabrous above, shortly pubescent beneath. **Seeds prolonged obovoid in semitranslucent cover which create wing hem, 6.3-6.9 x 3.1-3.5 mm. Surface longitudinal netlike, fine striate, lustrous, pale-brown, proper seeds brown.  $2n = 16$ .** Native to Europe, peaty spruce forest margins, forest brookbanks. Hu, Pl, Ro, Sk, Uk.

**3939. *Veratrum lobelianum* Bernh., *V. album* subsp. *lobelianum* (Bernh.) Arcang.** — Perennial, similar to *V. album*, stems 50-70 cm high, perianth-segments greenish on both surfaces and longer bracts as



in *V. album*. **Seeds prolonged obovoid, proper seed prolonged obovoid in semitranslucent cover created wings, 7-8 x 3.2-3.8 mm. Surface longitudinal fine striate, lustrous, yellowish, proper seeds pale-brown.  $2n = 32$ .** Native to circumpolar territories, mountain meadows, pastures, forest clearings, dwarf pine areas, peat margins. Br, Pl, Sk, Uk.

**3940. *Veratrum nigrum* L.** — Perennial, stems 60-130 cm high, softly hirsute, lower leaves broadly ovoidal, upper linearly lanceolate. **Seeds prolonged obovoid, proper seed in semitranslucent cover created wing hem around, 12-16 x 4.4-5.2 mm. Surface longitudinal nett, fine striate, lustrous, pale-brown, proper seeds brown.  $2n = 16, 32$ .** Native to Eurasia, on light woods, alpine pastures and meadows, fenlands. Hu, Mo, Pl, Ro, Uk.

**3941. *Anthericum liliago* L.** — Perennial, stems 20-70 cm high, clusters of 6-10 flowers. **Seeds ovoid or irregular shaped, dorsal side rounded, ventral rooflike or 3-angular with hilum, 3-3.4 x 1.9-2.2 mm. Surface with fine netlike structure, lustrous, black.  $2n = 64$ .** Native to Europe, sunny, stony and shrubby slopes, forest steppes. Hu, Mo, Pl, Ro, Sk, Uk.

**3942. *Anthericum ramosum* L.** — Perennial, stems erect, 30-120 cm high, inflorescence ramified or in cluster. **Seeds ellipsoid or oval, dorsal side rounded, ventral rooflike, whitish hilum, 2.7-3.1 x 1.8-2 mm. Surface with fine netlike structure, slight lustrous, black.  $2n = 32$ .** Native to Europe, sunny, stony slopes, forest steppes, rocks and sandbanks; in all Carpathian regions.

**3943. *Bulbocodium vernum* L.** — Perennial, with a corm up to 3 cm in diam., stems 5-20 cm high, leaves 3-4 up to 15 x 15 cm, linear, obtuse, capsule 1.5-2 cm long. **Seeds  $\pm$  spherical or semispherical with atypical suture on the ventral side, apex acuminate, 2-3 x 1.5-2.1 mm. Surface granulate, lustreless, cinnamon-brown, suture dark-brown.** Native to the Pyrenees and the Alps, post-glacial relict of mountain meadows; in the Carpathians rarely cultivated in gardens. Hu, Ro.

**3944. *Hosta coerulea* (Andr.) Tratt., *Funkia ovata* Spreng.** — Perennial, 30-50 cm high, stems erect, leaves broadly ovoidal up to  $\pm$  cordate, clusters with 10-15 flowers. **Seeds oval, lateral compressed, winged, 12-14 x 4.5-5.5 mm. Surface of netlike structure, lustrous, black.  $2n = 24, 36, 48, 60$ .** Orig-

inally growing in Japan; in the Carpathians cultivated (in many cvs) as a permanent ornamental plant in parks and gardens.

**3945. *Hosta lancifolia* Spreng., *H. japonica* (Thunb.) Aschers.** — Perennial, plant and stem up to 30 cm high, leaves lanceolate, deep-green, clusters with 6-10 flowers. **Seeds prolonged ovoid, flattish, winged, 13-14 x 4.8-5.4 mm. Surface of netlike structure, lustrous, black.  $2n = 48, 60$ .** Originally growing in Japan; in the Carpathians rarely cultivated as an ornamental plant in gardens and parks.

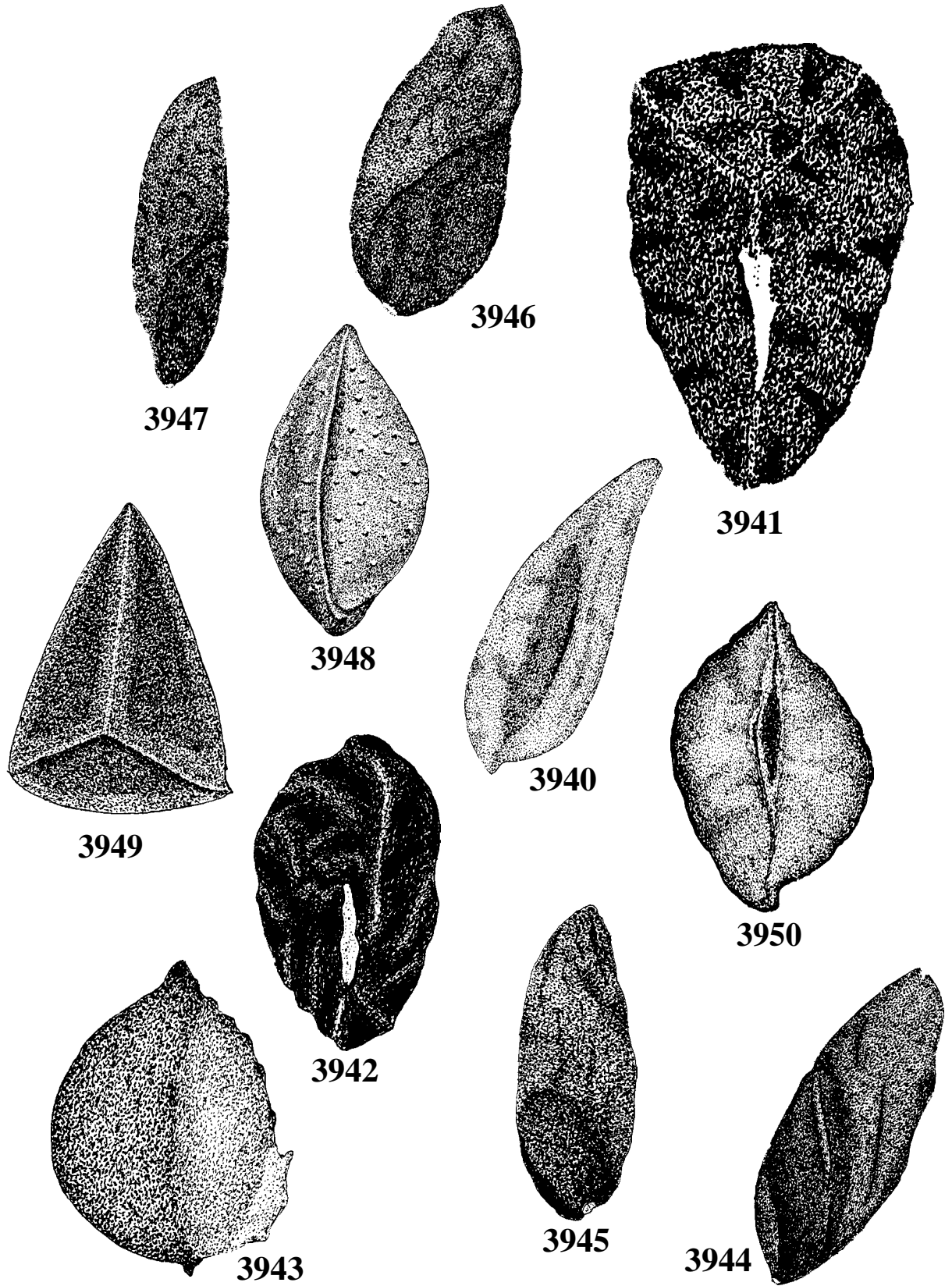
**3946. *Hosta plantaginea* (Lamk.) Aschers., *Funkia subcordata* Spreng.** — Perennial, stems 30-50 cm high, leaves cordately ovoidal, flower cluster with 9-15 flowers. **Seeds prolonged ovoid, lateral compressed, winged, 10-12 x 4.5-5.5 mm. Surface longitudinal fine striate, lustrous, black.  $2n = 60$ .** Originally in Japan, introduced into the Carpathians and cultivated as an ornamental permanent plant in gardens and parks.

**3947. *Hosta sieboldiana* (Lindl.) Engl., *Funkia sieboldii* Lindl.** — Perennial, stem 30-40 cm high, flowers in cluster, leaves cordately ovoidal. **Seeds oval, lateral compressed, winged, 8-9.5 x 2.8-3.2 mm. Surface longitudinal fine striate, lustrous, black.  $2n = 60$ .** Originally growing in Japan, introduced into the Carpathians and rarely cultivated as permanent ornamental plant in gardens and parks for wonderful leaves and flowers.

**3948. *Asphodelus albus* Mill., incl. *A. arrondeaui* Lloyd, *A. subalpinus* Gren. et Gordon** — Perennial, scapes 30-150 cm high, solid, usually simple, or with short branches at inflorescence base. **Seeds  $\pm$  ovoid, lateral side with suture, apex bluntly acute, bottom narrowed, 7-8 x 3.8-4.3 mm. Surface granular with white spots, slight lustrous, dark-grey.  $2n = 78$ .** Native to southern Europe, meadows, heaths, open woods and mountain pastures. Hu.

**3949. *Asphodeline lutea* (L.) Rchb., *Asphodelus luteus* L.** — Perennial, stems 40-90 cm high, simple, unramified, erect. **Seeds tetrahedral with depressed walls, 6-6.6 x 4.4-5 mm. Surface fine foveolate, dull, greyish-black.  $2n = 28$ .** Native to the Mediterranean, rare on stony slopes, in shrubberies, rocky areas and light woods. Ro, Uk.

**3950. *Kniphofia uvaria* (L.) Hook., *Tritoma uvaria* Ker.-Gawl.** — Perennial, stem mighty, 80-200 cm high,



basal leaves, 80-130 x 1.5-2.5 cm, inflorescence spindleform. **Seeds trihedral or tetrahedral, in outline spindleform, 3.6-4.4 x 2.4-2.8 mm. Surface verrucose, dull, yellowish, dark-brown.** Originally growing in southern Africa; in the Carpathians cultivated as decorative plant in numerous cvs.

**3951. *Eremurus robustus*** Regel. — Perennial, stems 150-250 cm high, basal leaves in rosette, tongue-shaped up to 6 cm wide, stiff. **Seeds obtriangular, with large semitransparent membrane, 10-12 x 6-8 mm. Surface undulate, dull, brown, membrane pale yellowish-brown.** Native to the steppes of central Asia; in the Carpathians rarely planted as an exotic plant in groups off 3-5 near buildings.

**3952. *Eremurus stenophyllus*** (Boiss. et Bushe) Bak. — Perennial, stems 50-70 cm high, with grassy leaves, flowers deep-yellow. **Seeds 3- or 4-angular, semitransparent membrane at each edge, 4.7-5.3 x 3-3.4 mm. Surface granulous, with small pieces of the edge membrane, dull, dark-brown.** Native to central Asia; in the Carpathians rarely cultivated for ornament in gardens.

**3953. *Hemerocallis fulva*** (L.) L., *H. crocea* Lam. — Perennial, stems up to 1 m high, leaves broadly linear. **Seeds ovoid or oval, 6-7 x 3.4-4 mm. Surface glabrous, high lustrous, black. 2n = 22, (33), 44, 48.** Native to southern Europe; in the Carpathians often cultivated in gardens, occasionally escaping and naturalized in grassy places, forest and shrub margins, riverbanks and damp meadows. Hu, Mo, Ro, Sk, Uk.

**3954. *Hemerocallis lilio-asphodelus*** L. em. Scop., *H. flava* L. — Perennial, stems 50-100 cm high, leafless groundish, leaves linear, 40-60 cm long. **Seeds obovoid-obconic or oval and rounded, 3.8-6.8 x 2.5-5 mm. Surface glabrous, lustrous, black. 2n = 22.** Native to southern Eurasia; in the Carpathians rarely cultivated as a permanent ornamental plant in some cvs in gardens, uniquely naturalized by river sides and in wet meadows. Hu, Mo, Ro, Sk, Uk.

**3955. *Hemerocallis middendorffii*** Traut. et Meyer — Perennial, stems up to 50 cm high, flowers in clusters (3-5). **Seeds obovoid or oval, 5-5.6 x 3.3-3.7 mm. Surface glabrous, highly lustrous, black.** Originally spread from eastern Asia; in the Carpathians rarely cultivated as an ornamental plant in gardens.

**3956. *Aloe arborescens*** Mill. — Shrub, loosely branched, with erect and spreading stems, up to 3 m height, 5-10 cm in diam., leaves fleshy, arranged in rosette. **Seeds broad spindleform, trihedral or tetrahedral, distinct hemmed at each edge, 4.2-4.8 x 2.1-2.5 mm. Surface wrinkly and fine verrucose, lustrous, greyish-black.** Originally growing in southern Africa; at present frequently cultivated in flowerpots as an ornamental and also medicinal plant.

**3957. *Colchicum arenarium*** Waldst. et Kit. — Perennial, plant with 3-5 linear-lanceolate leaves, bulb 2-3 cm long with red-brown scales. **Seeds oval, dorsal side spherical, ventral with longitudinal caruncle, with small beak on apex, 2.5-3 x 1.8-2.2 mm. Surface wrinkly, lustreless, dark-brown. 2n = 38, 54.** Native to the Pannonian lowland, sandbanks, sand steppes and pastures. Hu, Ro, Sk.

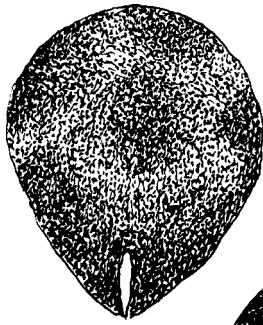
**3958. *Colchicum autumnale*** L. subsp. *autumnale* — Perennial, a plant 10-30 cm high, bulb deep in the soils. **Seeds obovoid or globular with narrowed bottom and hilum, 2.9-3.5 x 2.1-2.3 mm. Surface wrinkly, lustreless, blackish-brown. 2n = 38.** Native to Europe, moist meadows, fenlands, lowland forests, with nutritious, neutral to acidic soils. Br, Hu, Pl, Ro, Sk, Uk.

**3959. *Colchicum hungaricum*** Janka — Perennial, leaves (2-3) 3-10 cm long at anthesis, up to 20 cm x 10-20 mm when mature, linear-lanceolate, acute, margins retrorsely ciliate. **Seeds spherical, usually with caruncle at bottom, 1.8-2.2 x 1.7-1.9 mm. Surface roughened, faint lustrous, dark-brown. 2n = 54.** Native to south-central Europe, stony places and dry hillsides. Hu, Ro.

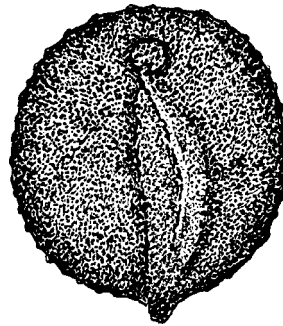
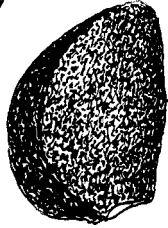
**3960. *Colchicum neapolitanum*** (Ten.) Ten., *C. haynaldii* Heuffel — Perennial, stems 18-35 cm high, leaves (4-6) 12-15 cm x 10-20 mm, flowers 1-4. **Seeds ± spherical, with caruncle at bottom, 2.6-3 x 2.3-2.7 mm. Surface humpy, lustrous, dark-brown.** Native to southern Europe, dry forest clearings on upland hills and shrubberies. Ro.

**3961. *Colchicum speciosum*** Steven — Perennial, flowers 1-4 in fascicles, light rose-red. **Seeds spherical, hilum with caruncle, 3.2-3.8 x 2.8-3.2 mm. Surface ruminant, slight lustrous, dark-brown.** Native to the Caucasus; in the Carpathians rarely cultivated for ornament in gardens.

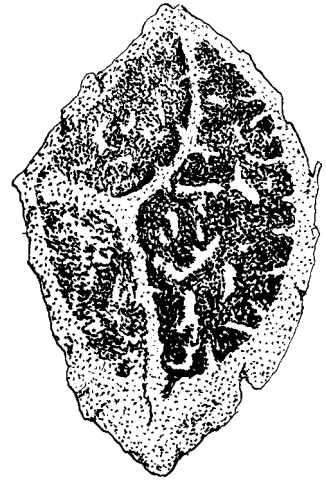




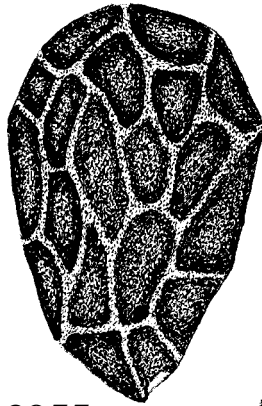
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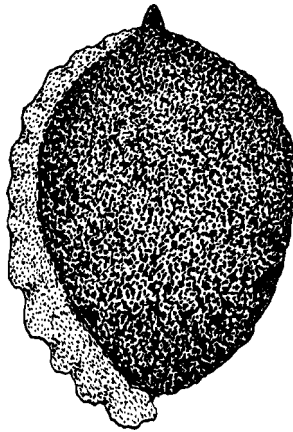
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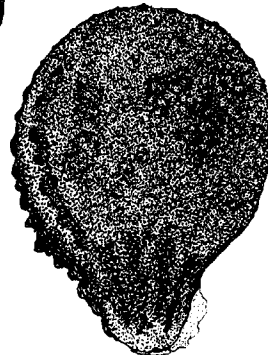
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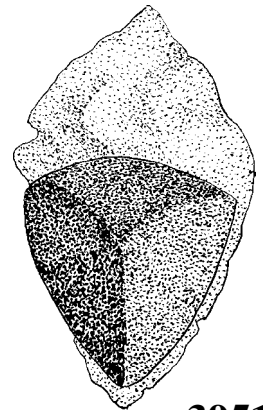
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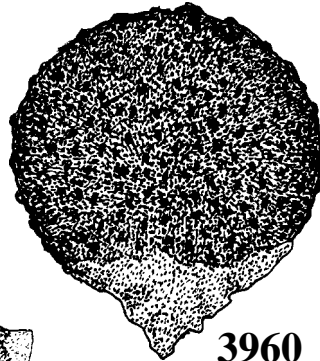
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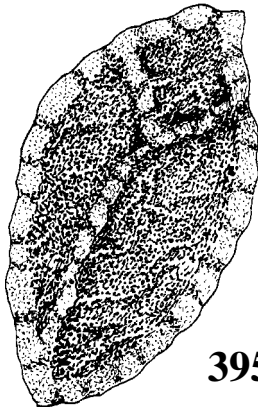
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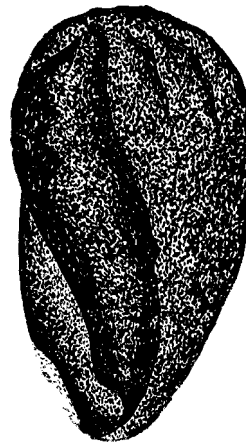
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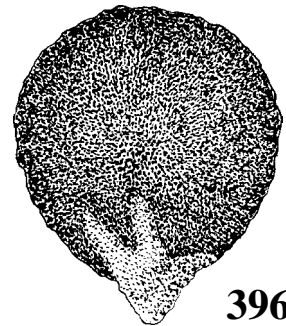
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**3962. *Gagea lutea* (L.) Ker.-Gawl., *Ornithogalum luteum* L.** — Perennial, stem 10-30 cm long, bare, only with a single basal leaf, false umbels of 1-10 flowers. **Seeds  $\pm$  cylindric, mostly crooked, with undulate longitudinal wing on ventral side, 2.3-3 x 1.2-1.5 mm. Surface longitudinal faint striate, lustreless, reddish-brown.  $2n = 24, 72$ .** Native to Eurasia, meadows, grassy slopes, boundaries, humous forests, lowland woods throughout the Carpathians.

**3963. *Gagea minima* (L.) Ker.-Gawl., *Ornithogalum minimum* L.** — Perennial, stem thin, feeble, bare, with 2 leaves (rarely one), basal leaf only one, lanceolate. **Seeds  $\pm$  cylindric, crooked, with longitudinal undulate wing on ventral side, apex with beak, bottom with large hilum, 1.5-1.7 x 1-1.2 mm. Surface longitudinal ribbed, transversal wrinkly, lustreless, orange-brown.  $2n = 24$ .** Native to Euro-Siberia, light woods and their margins, humous, moist forests, grassy forest clearings; in all Carpathian territories.

**3964. *Gagea pratensis* (Pers.) Dumort., *Ornithogalum pratense* Pers.** — Perennial, only one deeply keeled basal leaf, flowers yellow, cymes composed of 1-5 flowers. **Seeds cylindric with longitudinal caruncle on ventral side, 2.3-2.5 x 1.1-1.3 mm. Surface longitudinal shallow furrowed, lustreless, reddish-brown.  $2n = 60$ .** Native to Eurasia, meadows, grassy slopes, boundaries, light forests, vineyards, fields, roadsides, semidry turfs of all Carpathian territories.

**3965. *Gagea pusilla* (F. W. Schmidt) Schult. et Schult. fil., *Ornithogalum pusillum* F. W. Schmidt** — Perennial, stem 3-12 cm high, bare, sole, basal leaf linear, stem with 2-3 leaves. **Seeds reniform, without or with caruncle on ventral side, 1.6-1.8 x 0.9-1.1 mm. Surface longitudinal striate, lustreless, reddish-brown.  $2n = 24$ .** Native to Eurasia, sunny and grassy slopes, forest margins and steppes, sandbanks, boundaries of in all Carpathian territories.

**3966. *Gagea spathaeca* (Hayne) Salisb., *Ornithogalum spathaceum* Hayne** — Perennial, stem 6-20 cm high, feeble, bare, with 2 broader lanceolate leaves, basal leaves 2-3, threadly linear. **Seeds  $\pm$  oval, dorsal side spherical, ventral slight flat-tish with longitudinal, undulate wing, 2.3-2.6 x 1.5-1.7 mm. Surface transversal wrinkly, lustreless, reddish-brown.  $2n = 106$ .** Native to Europe, mixed humous, deciduous woods, lowland forests, moist shrubberies; in all Carpathian regions.

**3967. *Gagea szovitzii* (A. F. Láng) Besser** — Perennial, stems 3-10 cm high, cauline leaves (3-4) narrowly lanceolate, flowers 1-4, capsule obovoid, emarginate. **Seeds  $\pm$  spherical, with beak on apex, 1.2-1.4 x 0.7-0.9 mm. Surface fine reticulate-areolate, slight lustrous, brown.** Native to south-eastern Europe, dry, stony slopes. Ro, Uk.

**3968. *Gagea transversalis* (Pall.) Stev., *Ornithogalum transversale* Pall.** — Perennial, onions 3, in separate greyish scales (2 smaller and old onions), 1 basal leaf, narrowly linear (1-1.5 mm). **Seeds  $\pm$  cylindric, lateral slight compressed, usually with membranous wing on apex and lateral side, 1.6-2 x 0.8-1 mm. Surface longitudinal colliculate, slight lustrous, brown.  $2n = 48$ .** Native to Europe, meadows, pastures, shrubby slopes. Br, Mo, Sk, Uk.

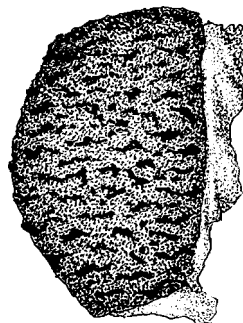
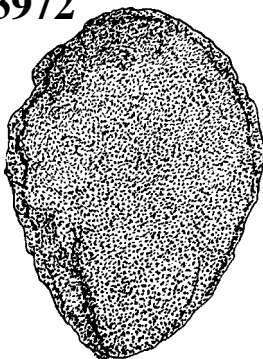
**3969. *Lloydia serotina* (L.) Rchb., *Bulbocodium serotinum* L.** — Perennial, stem 5-20 cm high, with 2-5 delayed linear up to linear lanceolate leaves, two basal leaves are threadlike. **Seeds semicircular, lateral compressed, with broad beak on apex, dorsal side spherical, ventral straight with lighter wing, 2.6-3 x 1.4-1.8 mm. Surface longitudinal striate, lustrous, reddish-brown.  $2n = 24$ .** Native to circumpolar territories, moist rocks, stony alpine meadows, reinforced screes, snow-deck-chairs. Pl, Ro, Sk, Uk.

**3970. *Erythronium dens-canis* L., *E. maculatum* Lam.** — Perennial, stem erect, 10-20 cm high, with 2 ovoid-ellipsoidal leaves and one sagged flower at base. **Seeds broadly spindleform with yellowish caruncle and string on ventral side, 3.2-3.8 x 1.6-2 mm. Surface longitudinal striate, lustrous, purple.  $2n = 24$ .** Native to Eurasia, beech forests, shrubby slopes on moister humous, basic up to neutral grounds. Hu, Mo, Pl, Ro, Sk, Uk.

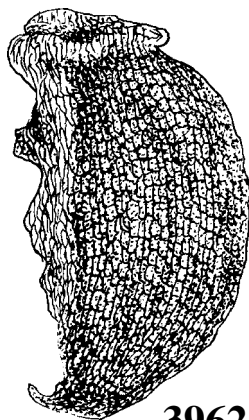
**3971. *Tulipa biebersteiniana* A. et J. Schult., *T. sylvestris* auct. non L.** — Perennial, stems glabrous, flowers yellow, rarely multicoloured, solitary. **Seeds semiobovoid, lateral strong compressed, with wide hem, 5.3-5.7 x 3.8-4.1 mm. Surface wrinkly and fine striate, slight lustrous, pale-brown.** Native to the southern Ukraine and the Caucasus, shrubby margins, oak-woods, sunny hills, leafy lowland forests. Mo, Pl, Ro, Uk.

**3972. *Tulipa clusiana* Vent.** — Perennial, stem 30-40 cm high, glabrous, flowers 25-60 mm in diam. **Seeds obovoid or oval, lateral strong compressed,**

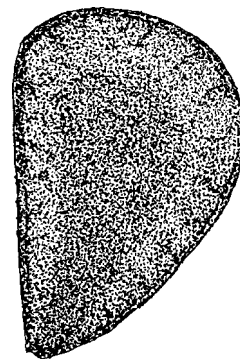
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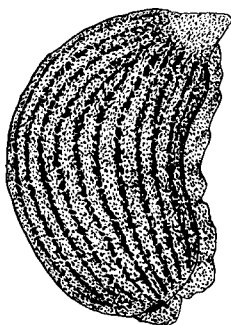
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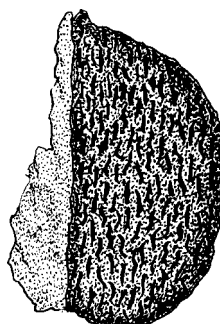
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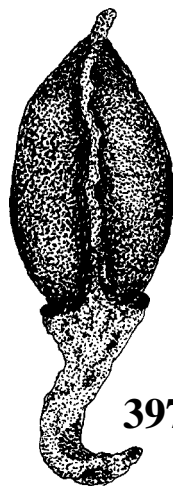
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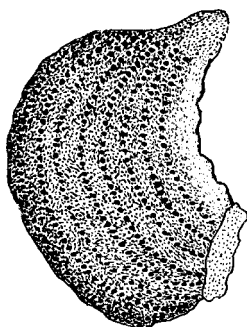
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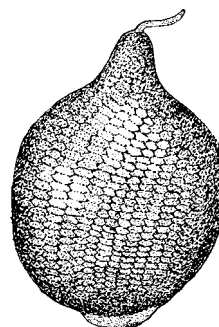
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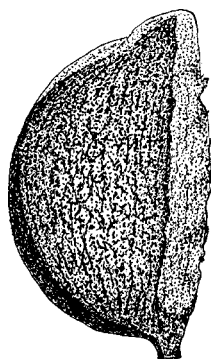
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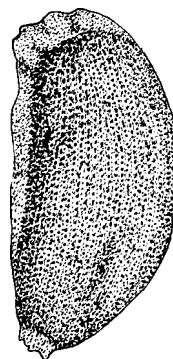
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with narrow hem around, 5-6 x 4-4.4 mm. Surface slight wrinkly and verrucose, slight lustrous, reddish-brown. Native to Asia Minor and the southeastern Mediterranean, cultivated in parks and gardens, well known as Lady tulip among flower-growers.

**3973. *Tulipa gesnerana* L.** — Perennial, stem erect, up to 50 cm high, bare or finely downy, poorly leafed. **Seeds obconic, lateral compressed, with hem around, 7.5-9 x 6-7 mm. Hem surface longitudinal striate, rest of area wrinkly, slight lustrous, reddish-brown. 2n = 24.** The common name for the complex of garden cultivars appeared for the first time in southwestern Asia, in Europe cultivated since 16. century.

**3974. *Tulipa sylvestris* L.** — Perennial, stem 20-50 cm high with numerous bulbs up to 2 cm in diam., leaves linear, striate, flowers single. **Seeds obconic or obovoid, lateral strong flattish, with hem around, 5.5-6.5 x 4.5-5.5 mm. Surface wrinkly, slight lustrous, brown. 2n = 24, 36, 48.** Native probably to southern Europe, cultivated in the Carpathians and often escaping into parks and gardens, mostly without flowers. Br, Hu, Mo, Pl, Ro.

**3975. *Fritillaria meleagris* L.** — Perennial, stem 12-30 cm high, simple, poorly leafed, flowers 1-3. **Seeds obconic, lateral compressed, apex truncate, gradually narrowed below, with hem around, 5-7 x 4.5-5.5 mm. Surface longitudinal (hem round) fine striate, lustrous, yellowish-brown. 2n = 24.** Native to Europe, moist and fen meadows, lowland forests, sporadically in overflooded, nutrient-rich soils. Hu, Pl, Ro, Sk, Uk.

**3976. *Fritillaria meleagroides* Patr. ex Schultes fil.** — Perennial, stems 25-60 cm high, leaves (3-7) alternate, flowers solitary. **Seeds mostly triangular, dorsal side ± truncate, ventral gradually narrowed, whole margin semimembranous, winged, 6-6.6 x 4.8-5.2 mm. Surface fine waved, lustrous, pale-brown.** Native to southeastern Europe, wet meadows and streamsides. Mo, Br, Uk.

**3977. *Fritillaria montana* Hoppe, *F. degeniana* J. Wagner** — Perennial, stems bare below, glabrous above, 20-80 cm high. **Seeds obconic, hem around, apex bended, bottom gradually narrowed, 5.8-6.6 x 5.3-6.1 mm. Hem surface longitudinal striate, the rest verrucose, lustrous, hem pale-brown, the rest dark-brown. 2n = 18.** Native to the Mediterranean,

shrubberies, deciduous woods, forest clearings and margins. Mo, Ro, Uk.

**3978. *Fritillaria orientalis* Adams, *F. tenella* M. Bieb.** — Perennial, stems 16-40 cm high, leaves (6-11) linear, usually opposite or in a whorl of 3. **Seeds ± triangular, lateral strong compressed, broad winged around, 4.8-5.8 x 4.2-4.8 mm. Surface fine waved, lustrous, brown. 2n = 18.** Native to southern and southeastern Europe; in the Carpathians rarely cultivated in gardening. Ro.

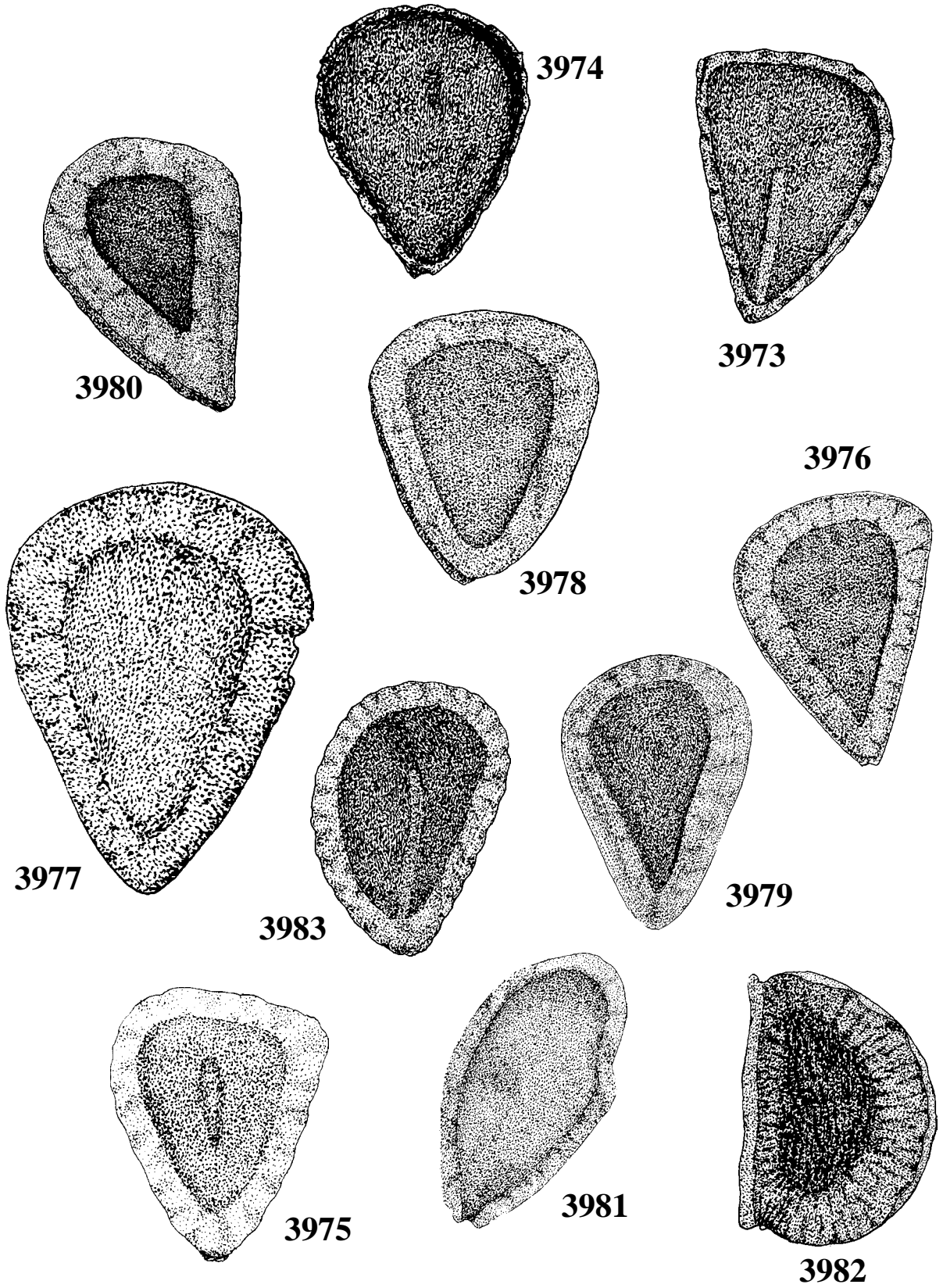
**3979. *Fritillaria pontica* Wahlenb.** — Perennial, stems 15-45 cm high, leaves usually 8, opposite or subopposite, seed capsule winged. **Seeds obovate, with wide membranous margin, apex little roundish, bottom gradually narrowed, 8.5-9.5 x 6-6.5 mm. Surface waved, faint lustrous, brown, margin pale-brown.** Native to the Balkan Peninsula, open woods and scrubs; in the Carpathians very rarely grown in gardening.

**3980. *Fritillaria ruthenica* Wikström, *F. minor* Ledeb.** — Perennial, stems 20-50 cm high, leaves (6-12) linear, opposite or in whorls of 3. **Seeds halfmoon-shaped, strong compressed, margin broad winged, 5-7 x 4-5 mm. Surface fine waved, faint lustrous, dark-brown, margin pale-brown. 2n = 18.** Native to southeastern Europe, woods, meadows, shrubberies and stony slopes. Br, Mo, Uk.

**3981. *Petilium imperiale* (L.) St.-Hil., *Fritillaria imperialis* L.** — Perennial, stem 60-100 cm high, above half densely leafed, above leafless, erect, non-branched. **Seeds prolonged obovate, lateral strong compressed, hem around, 11-13 x 6-7 mm. Surface fine wrinkly, lustrous, dark-brown. 2n = 24.** Originally growing in central Asia; in the Carpathians cultivated as a permanent ornamental plant in gardens. Br, Mo, Uk.

**3982. *Lilium auratum* Wilson** — Perennial, stem erect, 40-150 cm high, verrucose, rough, raceme with 3-25 aromatic flowers. **Seeds planoconvex, lateral strong compressed, hem around, 7-9.5 x 5-6.5 mm. Hem surface longitudinal striate, the rest verrucose, slight lustrous, hem pale-, the rest dark-brown. 2n = 24.** Originally spread from eastern Asia; in the Carpathians often cultivated as a permanent ornamental plant.

**3983. *Lilium bulbiferum* L., *L. spectabile* Link** — Perennial, stem erect, 40-120 cm high, densely leafy,



below shortly, above woolly hirsute, leaves alternate. **Seeds oval or obovate, hem around, 8-10 x 6-7 mm. Hem surface fine striate, the rest of area verrucose, slight lustrous, brown.  $2n = 24$ .** Native to central and southern Europe, forest meadows and margins, sunny shrubby slopes and mountain meadows. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**3984. *Lilium candidum* L.** — Perennial, stem erect, up to 120 cm high, densely leafy, raceme with 5-20 flowers. **Seeds oval or semioval, lateral strong flattish, hem around, 8-10 x 6-8 mm. Hem surface fine striate, rest of the area verrucose, slight lustrous, hem pale-, rest dark-brown.  $2n = 24$ .** Native to the Mediterranean; in the Carpathians often cultivated as a permanent ornamental in gardens, parks and flowerpots.

**3985. *Lilium jankae* A. Kern., *L. carniolicum* Bernh.** — Perennial, stems 30-90 cm high, erect, glabrous, raceme with 40-80 flowers. **Seeds lateral strong flattish, obovoid, apex round, bottom gradually narrowed, 8-8.8 x 5.7-6.3 mm. Surface verrucose, slight lustrous, dark-brown, hem pale.  $2n = 24$ .** Native to southern Europe, mountain meadows (at altitudes of 500-1700 m) grassy and stony slopes, shrubberies. Ro.

**3986. *Lilium martagon* L.** — Perennial, stem erect, oval, bare or downy, 30-150 cm high, raceme with 5-20 flowers. **Seeds obovoid, lateral compressed, apex round, bottom gradually narrowed, hem around, 6-7 x 4.2-5.2 mm. Hem surface fine striate, rest of the area verrucose, slight lustrous, brown.  $2n = 24$ .** Native to Euro-Siberia, leafy and mixed woods, shrubberies, mountain meadows, rocky hills; throughout the Carpathians often cultivated as a permanent ornamental, medicinal and honey-bearing plant in gardens.

**3987. *Lilium regale* Wils., *L. myriophyllum* Hort. non Franch.** — Perennial, stems 40-150 cm high, rough papillary, raceme with 3-25 flowers. **Seeds rhomboidal, oval or obovate, strong flattish, 7-8.5 x 4.5-5.5 mm. Hem surface longitudinal striate, rest of the area verrucose, slight lustrous, dark-brown, hem pale.  $2n = 24$ .** Originally growing in eastern Asia; in the Carpathians often cultivated as a permanent ornamental plant in gardens.

**3988. *Lilium tigrinum* Ker.-Gawl.** — Perennial, stem erect, 60-120 cm high, dark-brown, white cobwebbed, flowers spotted blackish-violet. **Seeds mostly semiround or oval, lateral compressed, 6.5-7.5 x**

**5-5.8 mm. Hem surface longitudinal striate, rest of the area verrucose, slight lustrous, hem pale-, the rest dark-brown.  $2n = 24, 36$ .** Native to eastern Asia; in the Carpathians often cultivated as a permanent ornamental in gardens.

**3989. *Urginea maritima* (L.) Baker, *Scilla maritima* L.** — Perennial, stems erect, 50-150 cm high (inclusive inflorescence). **Seeds ovate, flattish, with large wing, 5.4-6.2 x 3-3.4 mm. Surface longitudinal slight reticulate, lustrous, brownish-black.** Native to the eastern Mediterranean and northern Africa; in the Carpathians rarely cultivated as a medicinal plant inside or in greenhouses.

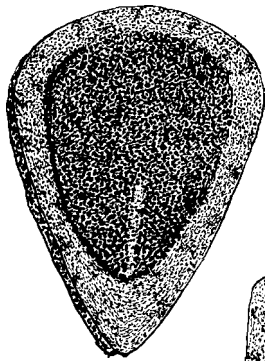
**3990. *Scilla amoena* L.** — Perennial, stems 10-30 cm high, angular, some of them appearing from one bulb. **Seeds oval or spherical, with one longitudinal rib and without aril, 2-2.4 x 1.7-2 mm. Surface smooth or faint verrucose, lustreless, dark-brown.  $2n = 12$ .** Native probably to western Asia, or appearing spontaneously as mutant; in the Carpathians widely cultivated as an ornamental in gardens and parks, sometimes naturalized. Ro, Sk.

**3991. *Scilla autumnalis* L.** — Perennial, stems 1-3 appearing from one bulb, 5-20 cm high, slightly violet. **Seeds spindle-shaped, with longitudinal furrow on ventral side, 2.4-2.8 x 1.8-2 mm. Surface rough wrinkly, dull, black.  $2n = 14, 28, 42$ .** Native to Eurasia, saline grounds, forest clearings, cut-over areas and lowland forests. Hu, Mo, Ro, Uk.

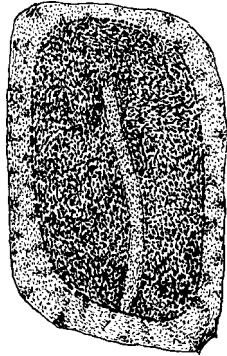
**3992. *Scilla bifolia* L.** — Perennial, stem 5-20 cm high, thin, only one stem emerging from each bulb. **Seeds spherical, with shall furrow and big yellowish or brownish aril at bottom, 2.4-3 x 1.6-2 mm. Surface faint ruminant, lustrous, pale- or dark-brown up to black.  $2n = 18, 36$ .** Native to Europe, moist valley meadows, lowland woods and shrubberies of all Carpathian territories; in Slovakia growing in subsp. *danubialis* Speta.

**3993. *Scilla bithynica* Boiss.** — Perennial, stem up to 25 cm,  $\pm$  as long as leaves, inflorescence with 3-20 flowers. **Seeds obovate with rib or narrow wing on ventral side, 2-2.5 x 1.9-2.1 mm. Surface wrinkly, dull, black.** Native to northwestern Anatolia. Ro.

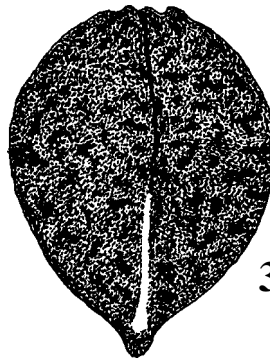
**3994. *Scilla non-scripta* (L.) Hoffmans et Link, *Endymion nutans* Dumort.** — Perennial, leaves 3-6, linear to linear-lanceolate, raceme 4-16-flowered, unilateral. **Seeds prolate spheroid, 2-2.3 x 1.8-2 mm.**



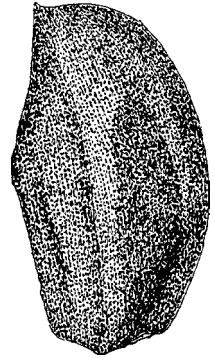
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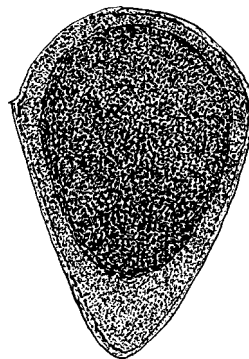
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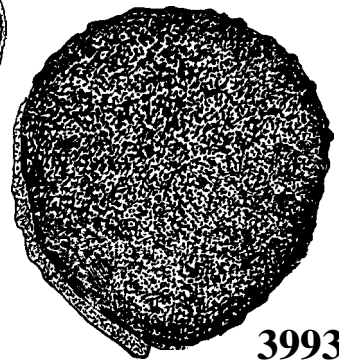
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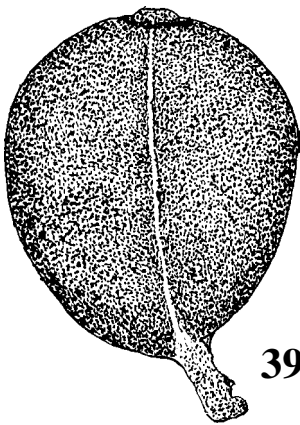
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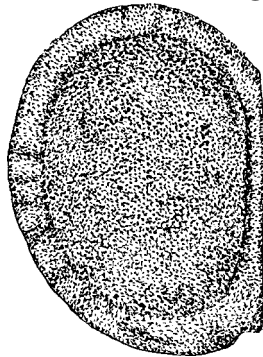
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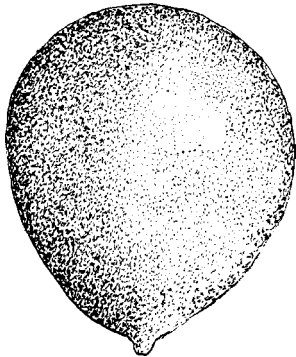
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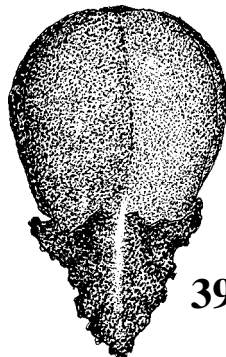
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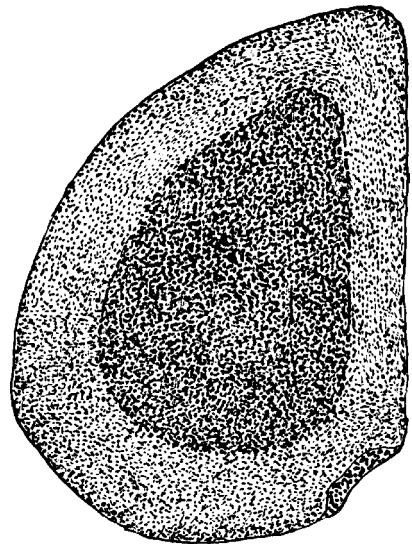
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**Surface smooth, black.** Native to northern Europe; in the Carpathians rarely cultivated for ornament in gardens, uniquely escaping and naturalized.

**3995. *Scilla siberica*** Haw., *S. cernua* Red. — Perennial, stems 10-30 cm high, angular, few stems growing from one bulb, leaves broadly linear. **Seeds obovate with one rib and without aril, 2.7-3.2 x 1.8-2.2 mm. Surface slight verrucose and puberulent, dull, violet-brown. 2n = 12, 18.** Native to western Asia; in the Carpathians often cultivated as a permanent ornamental in gardens and parks, uniquely escaping.

**3996. *Scilla vindobonensis*** Speta — Perennial, stems 5-20 cm high, only one stem (from each bulb). **Seeds smaller and lighter coloured than those in *S. bifolia*, with lighter aril below, 2.5-2.8 x 1.5-1.8 mm. Surface ruminant, fine lustrous, pale-brown. 2n = 18.** Native to central Europe, moist meadows, lowland woods and scrubs. Au, Sk.

**3997. *Ornithogalum boucheanum*** (Kunth) Asch., *Honorius boucheanus* (Kunth) Holub — Perennial, stems erect, 20-50 cm high, leaves (3-6) linear, raceme dense, with 5-20 flowers. **Seeds spherical, apex rounded with humplet, 2-2.4 x 1.9-2.2 mm. Surface distinct reticulate, slight lustrous, brownish-black. 2n = 28.** Native to Europe, meadows, grassy boundaries, fallows, vineyards and shrubberies. Hu, Mo, Pl, Ro, Sk, Uk.

**3998. *Ornithogalum brevistylum*** Wolfner, *O. narbonense* Neilr. *O. pyramidale* L. — Perennial, stems 30-100 cm high, erect, leaves (4-7) linear, persistent usually until anthesis. **Seeds ± obovate, upper part rounded, lower part intense narrowed, 3.4-4.2 x 2.5-3 mm. Surface short longitudinal furrowed, faint lustrous, black. 2n = 14, 16, 18.** Native to Europe, dryer meadows, pastures, fallow fields, boundaries, fields, rare in warmer areas. Hu, Ro, Sk.

**3999. *Ornithogalum collinum*** Guss., *O. gussonei* Ten., *O. tenuifolium* Guss. — Perennial, plant 10-40 cm high, peduncles 10-20 cm, smooth, glabrous, erect, with 3-20 flowers. **Seeds spherical or subglobular, with raphe on ventral side, 1.8-2.2 x 1.1-1.4 mm. Surface reticulate-areolate, wrinkly later on, lustreless, black.** Native to central and Mediterranean Europe, dry slopes, forest clearings and steppes, saline grounds, shrubberies, meadows, uncultivated areas of montane and subalpine zones. Hu, Mo, Pl, Ro, Uk.

**4000. *Ornithogalum comosum*** L. — Perennial, stems erect, 15-50 cm high, bare, raceme with 10-30 flowers. **Seeds spherical, 2.3-2.7 x 2-2.4 mm. Surface reticulate, lustrous, black. 2n = 14, 18.** Native to central and southern Europe, fallows, boundaries, pastures, on warming dry, stony, often calcareous soils, in the warmest areas of the Carpathians. Hu, Ro, Sk.

**4001. *Ornithogalum divergens*** Boreau, *O. umbellatum* subsp. *divergens* (Boreau) Á. et D. Löve — Perennial, stems up to 30 cm high, leaves up to 8 mm wide, a little longer than inflorescence, with white middle stripe. **Seeds ± spherical, 1.5-1.7 x 1.4-1.6 mm. Surface reticulate-areolate, faint lustrous, black. 2n = 18, 42, 54.** Native to southern Europe, dry pastures and waste places. Ro, Sk.

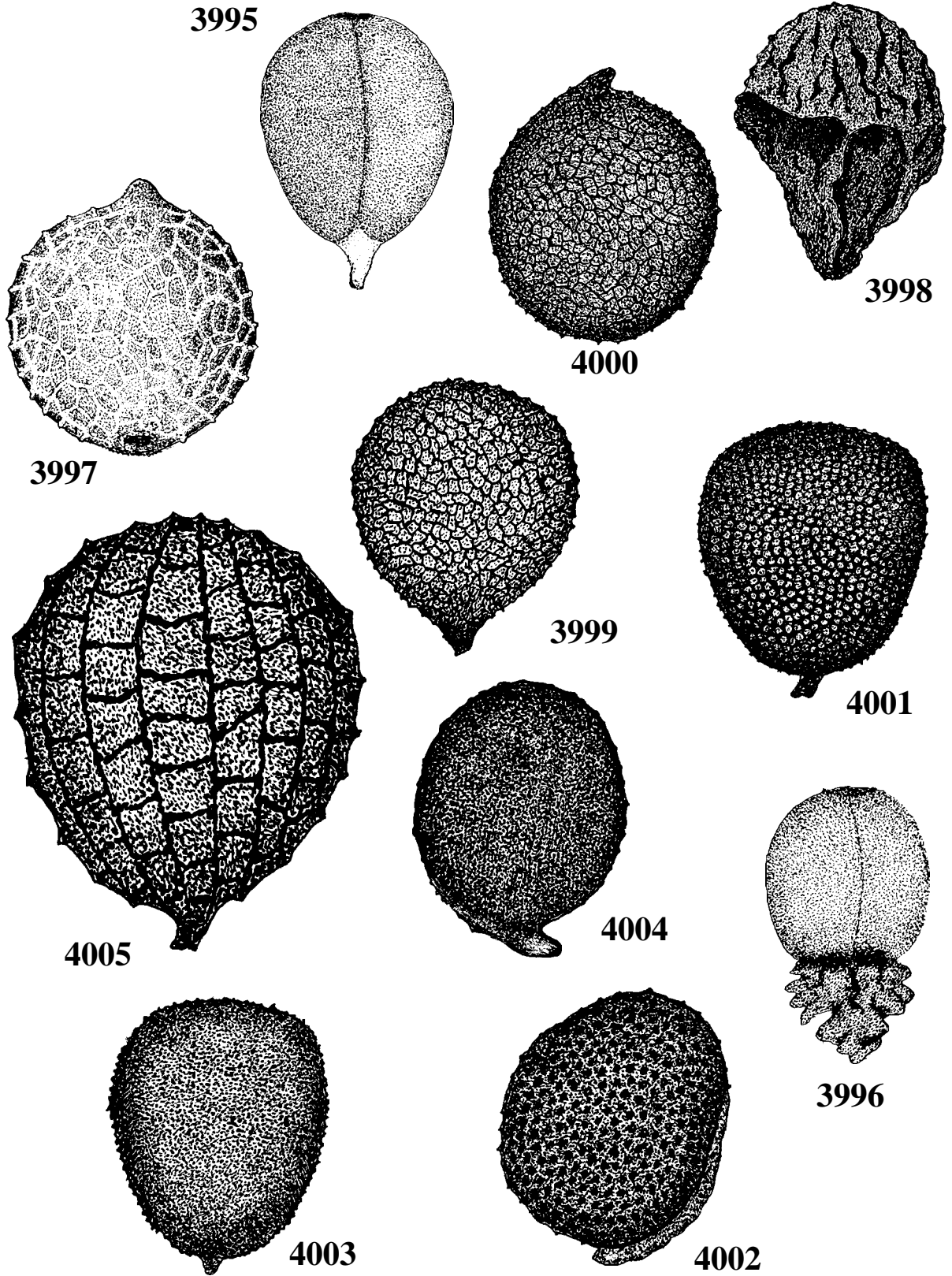
**4002. *Ornithogalum fimbriatum*** Willd., *O. roegnerianum* K. Koch — Perennial, stems 2.5-15 cm high, inflorescence 3-20 flowers. **Seeds globular, elliptic or cylindric with rib on ventral side, 2.3-2.7 x 1.8-2.2 mm. Surface reticulate-areolate, slight lustrous, brownish-black. 2n = 12.** Native to southeastern Eurasia, forest steppes, cut-over areas, light woods and dry places. Mo, Ro, Uk.

**4003. *Ornithogalum kochii*** Parl., *O. gussonei* auct. non Ten., *O. tenuifolium* auct. non Guss. — Perennial, peduncles ± 10 cm, erect, thin, corymb with 6-20 flowers, leaves narrowly linear. **Seeds ± spherical or oval, 1.7-2 x 1.3-1.5 mm. Surface ruminant, slight lustrous, brownish-black to black. 2n = 18.** Native to Europe, grassy slopes, meadows, lawns, boundaries, forest margins and light shrubberies, scarce in warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**4004. *Ornithogalum narbonense*** L., *O. pyramidale* subsp. *narbonense* (L.) Ascherson et Graebner, *O. arcuatum* Velen. non Steven — Perennial, stems 20-30 cm high, erect, glabrous, rigid, inflorescence with 20-60 flowers. **Seeds multiform (globular, cylindric, oval) with raphe on ventral side, 2.5-4 x 1.8-2.3 mm. Surface wrinkly, slight lustrous, black. 2n = 54.** Native to the Mediterranean, uncultivated areas, shrubberies, autumnal cereals. Hu, Ro, Sk.

**4005. *Ornithogalum nutans*** L., *Honorius nutans* (L.) Gray — Perennial, stems 20-60 cm high, bare, 4-6 leaves broadly linear, raceme one-sided with 3-12 flowers. **Seeds ± spherical, 2.3-2.9 x 2-2.5 mm. Surface distinct reticulate, lustreless, brownish-black. 2n = 42.** Native to southeastern Europe; in the





Carpathians cultivated as a permanent ornamental in parks and gardens, occasionally naturalized on grassy areas. Hu, Pl, Ro, Sk, Uk.

**4006. *Ornithogalum pyrenaicum* L., *Loncomelos sphaerocarpus* (A. Kern.) Hrouda** — Perennial, stems 15-60 cm high, erect, rigid, inflorescence with 40-100 flowers. **Seeds multiform (tri-, quadri-, quinquehedral, cylindric, moonlike, etc.) 2.5-3.8 x 2-2.6 mm. Surface wrinkly, dull, black. 2n = 16, 18.** Native to Eurasia, leafy woods, cut-over areas, meadows, hills, cultivated areas. Mo, Ro, Sk, Uk.

**4007. *Ornithogalum refractum* Kit. et Schlecht.** — Perennial, bulb surrounded by numerous bulbils, stems 5-15 cm high, leaves 4-12 mm wide, with a white stripe on upper surface, glabrous, not ciliate. **Seeds of different shape (oval, halfmoon, ± spherical, irregular), 2.7-3.3 x 2-2.4 mm. Surface shallow wrinkly, dull, dark-brown. 2n = 54, 56, 72.** Native to Europe, stony or cultivated grounds. Hu, Mo, Ro, Uk.

**4008. *Ornithogalum sibthorpii* W. Greuter, *O. nanum* Sibth. et Sm. non Thunb.** — Perennial, stems 5-20 cm high, leaves (3-11), 1.5-7 wide, glaucous, longer than the inflorescence. **Seeds obovate or elliptic, rounded in transversal section, 1.8-2.2 x 1.3-1.6 mm. Surface humpy, faint lustrous, blackish-brown. 2n = 14, 18, 24, 28.** Native to southern Europe, arid hillsides. Ro.

**4009. *Ornithogalum sphaerocarpum* A. Kern., *O. pyrenaicum* L. subsp. *sphaerocarpum* (A. Kern.) Hegi** — Perennial, stems 30-100 cm high, erect, raceme with 30-60 flowers. **Seeds with abundant palette of shapes, mostly moonlike, trihedral, quinquehedral, etc., 2.7-3.3 x 1.9-2.3 mm. Surface wrinkly, dull, black. 2n = 18, 24.** Native to central and the Balkan countries, grassy and shrubby slopes, embankments, fallow, fields. Hu, Ro, Sk.

**4010. *Ornithogalum umbellatum* L.** — Perennial, plant 15-40 cm high, solitary or in groups, peduncles 20-30 cm high, bare. **Seeds oval, spherical or obovate, 2-2.3 x 1.4-1.6 mm. Surface wrinkly, slight lustrous, black. 2n = 18, 20, 27, 28, 35, 36, 42, 44, 45, 54, 72, 90, 108.** Native to central Europe, lawns, fallows, boundaries, fields, shrubberies and vineyards. Br, Hu, Pl, Ro, Sk, Uk.

**4011. *Chionodoxa luciliae* Boiss.** — Perennial, plant with two linear leaves, 10-25 cm high, erect, inflores-

cence with 1-5 flowers. **Seeds spherical with large yellowish caruncle on hilum, 3-3.4 x 2-2.3 mm. Surface fine verrucose, slight lustrous, black. 2n = 18, 20.** Native to Asia Minor; in the Carpathians rarely cultivated as garden and rock-gardens plant.

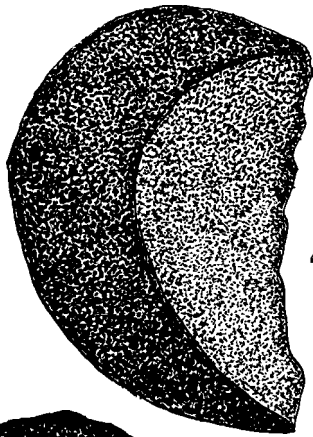
**4012. *Puschkinia scilloides* Adans.** — Perennial, stem erect, 10-20 cm high, bare, leaves 2, broadly linear. **Seeds ovate with rib on ventral side, round in section, 2.5-2.8 x 1.7-1.9 mm. Surface reticulate, slight lustrous, pale-orange. 2n = 10, 16.** Native to Front Asia; in the Carpathians often cultivated as a permanent ornamental in gardens and parks.

**4013. *Hyacinthus orientalis* L.** — Perennial, stem erect, 10-50 cm high, raceme with 5-20 flowers, bulb with 4-6 basal leaves. **Seeds semispherical with whitish aril on ventral side, 4-5 x 2.5-3 mm. Surface fine reticulate, lustreless, black. 2n = 16, 24, 32.** Originally spread from southwestern Asia; in the Carpathians cultivated long time ago in gardens, parks and flowerpots in numerous cvs.

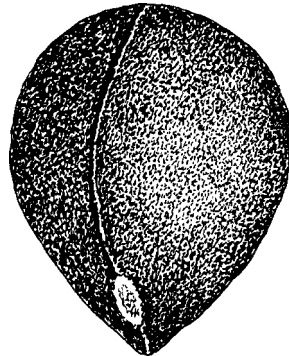
**4014. *Hyacinthella leucophaea* (K. Koch) Schur, *Hyacinthus leucophaeus* Stev.** — Perennial, plants 7-25 cm high, stems mostly solitary (seldom 2-3), bulb ovoidal, 15-30 mm. **Seeds ovate with rib on ventral side, 1.8-2.1 x 1.4-1.6 mm. Surface fine verrucose, dull, dark-brown to black.** Native to eastern Europe and Asia Minor, arid slopes, rocky clayey, sandy grounds, shrubberies, dry grasslands. Mo, Pl, Ro, Uk.

**4015. *Bellevalia romana* (L.) Rchb.** — Perennial, scapes 15-40 cm high, leaves 3-6, longer than the scapes, linear, racemes oblong, 20-30-flowered. **Seeds ± spherical or oval, with whitish hilum at bottom, 2.8-3.2 x 2.4-2.8 mm. Surface very fine waved, slight lustrous, black. 2n = 8.** Native to central and eastern Mediterranean region, meadows and tilled grounds; in the Carpathians rarely cultivated as ornamental in gardens.

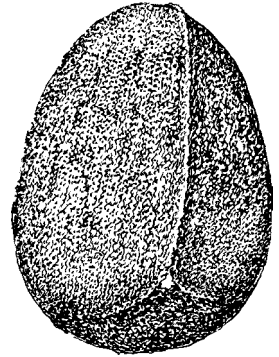
**4016. *Bellevalia sarmatica* (Pallas ex Georgi) Woronow, *Hyacinthus sarmaticus* Pall.** — Perennial, stem bare, 15-30 cm high, inflorescence with 20-40 flowers in raceme. **Seeds obovate or round with ± distinct rib on ventral side, 2.6-2.8 x 2.2-2.4 mm. Surface glabrous, slight lustrous, greyish-black.** Native to southeastern Europe, arid hills and woody steppes; in the Carpathians rarely cultivated as a permanent ornamental plant in gardens. Mo, Ro, Uk.



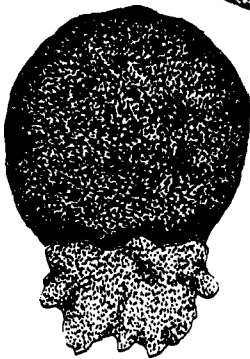
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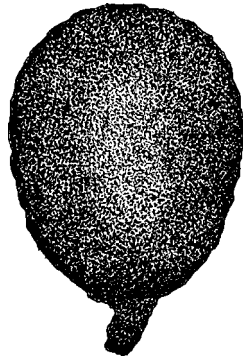
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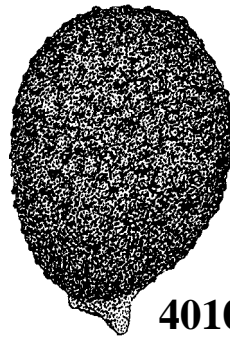
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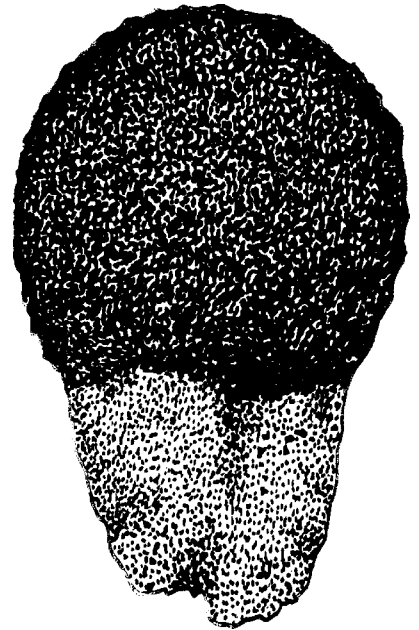
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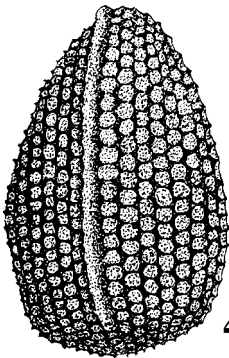
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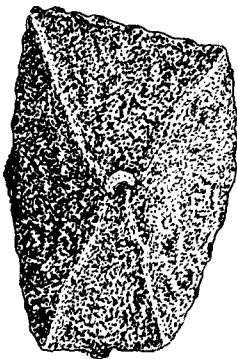
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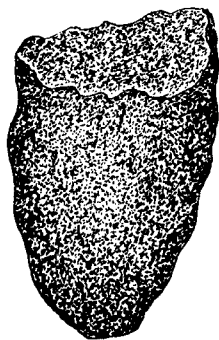
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**4017. *Muscari botryoides* (L.) Mill., *Hyacinthus botryoides* L., *M. carpaticum* Racib.** — Perennial, stems 10-35 cm high, lower and upper parts violet. **Seeds  $\pm$  spherical, with longitudinal suture on ventral side, 2.3-2.8 x 2.4-2.8 mm. Surface indistinct reticulate or wrinkly, lustreless, black.  $2n = (18), 36$ .** Native to Europe, light, leafy forests, pastures, vineyards and margins of shrubberies. Hu, Pl, Ro, Sk, Uk.

**4018. *Muscari commutatum* Guss.** — Perennial, plant 10-35 cm high, inflorescence with 10-30 flowers. **Seeds  $\pm$  globular or obovate, mostly with indistinct suture, 1.9-2.3 x 1.8-2.2 mm. Surface fine wrinkly, lustreless, black.  $2n = 18$ .** Native to the Mediterranean, rocky hills and clayey soils. Ro.

**4019. *Muscari comosum* (L.) Mill., *Leopoldia comosa* (L.) Parl.** — Perennial, plant 30-90 cm high, peduncles 15-50 cm high, erect, raceme 15-30 cm high, with 30-100 flowers. **Seeds globular with distinct or indistinct raphe on ventral side, 2.2-2.8 x 1.9-2.3 mm. Surface wrinkly, lustreless, black.  $2n = 18$ .** Native to Europe, sunny, stony and shrubby slopes, dry meadows, sandbanks, forest steppes, boundaries, fields and vineyards. Hu, Pl, Ro, Sk.

**4020. *Muscari racemosum* (L.) Mill.** — Perennial, stems 5-30 cm high, 3-6 leaves growing out from one onion, thin, linear, flower cluster dense. **Seeds spherical with distinct raphe, 1.8-2 x 1.6-1.8 mm. Surface undulate, faint lustrous, black.  $2n = 54$ .** Native to Europe, sunny, grassy and shrubby slopes, vineyards, stony boundaries and fallows. Hu, Mo, Pl, Ro, Sk, Uk.

**4021. *Muscari neglectum* Guss. ex Ten., *M. speciosum* Marches., *Botryanthus speciosus* Marches.** — Perennial, stems 10-40 cm high, 6-9 leaves emerging from one bulb, raceme with 30-40 flowers. **Seeds  $\pm$  spherical, apex truncate, bottom with large hilum, 2.2-2.6 x 2-2.2 mm. Surface mostly glabrous or fine waved, black.  $2n = 18, 36, 45, 54, 72$ .** Native to Eurasia, vineyards, grassy slopes and fallows. Mo, Ro, Sk, Uk.

**4022. *Muscari tenuiflorum* Tausch, *Leopoldia tenuiflora* (Tausch) Heldr.** — Perennial, plant similar to *M. comosum*, 20-60 cm high, with sterile and fructiferous flowers. **Seeds spherical with distinct or indistinct raphe, apex slight truncate, 2.4-3 x 2-2.4 mm. Surface fine wrinkly, lustreless, black.  $2n = 18$ .** Native to Europe, sunny, shrubby slopes, forest margins and steppes, fallows. Hu, Pl, Ro, Sk.

**4023. *Allium albidum* Fischer ex M. Bieb., *A. flavescens* Besser, *A. ammophillum* Heuffel** — Perennial, bulbs 0.5-1 cm in diam., stems 10-30 cm high, slightly ribbed, leaves 5-9, basal, filiform, 4-14 cm x 0.3-2.5 mm. **Seeds  $\pm$  halfmoon-shaped, lateral strong compressed, 3.5-4 x 2.4-2.8 mm. Surface fine reticulate, with elevated venation, slight lustrous, black.  $2n = 16$ .** Native to southeastern Europe. Ro.

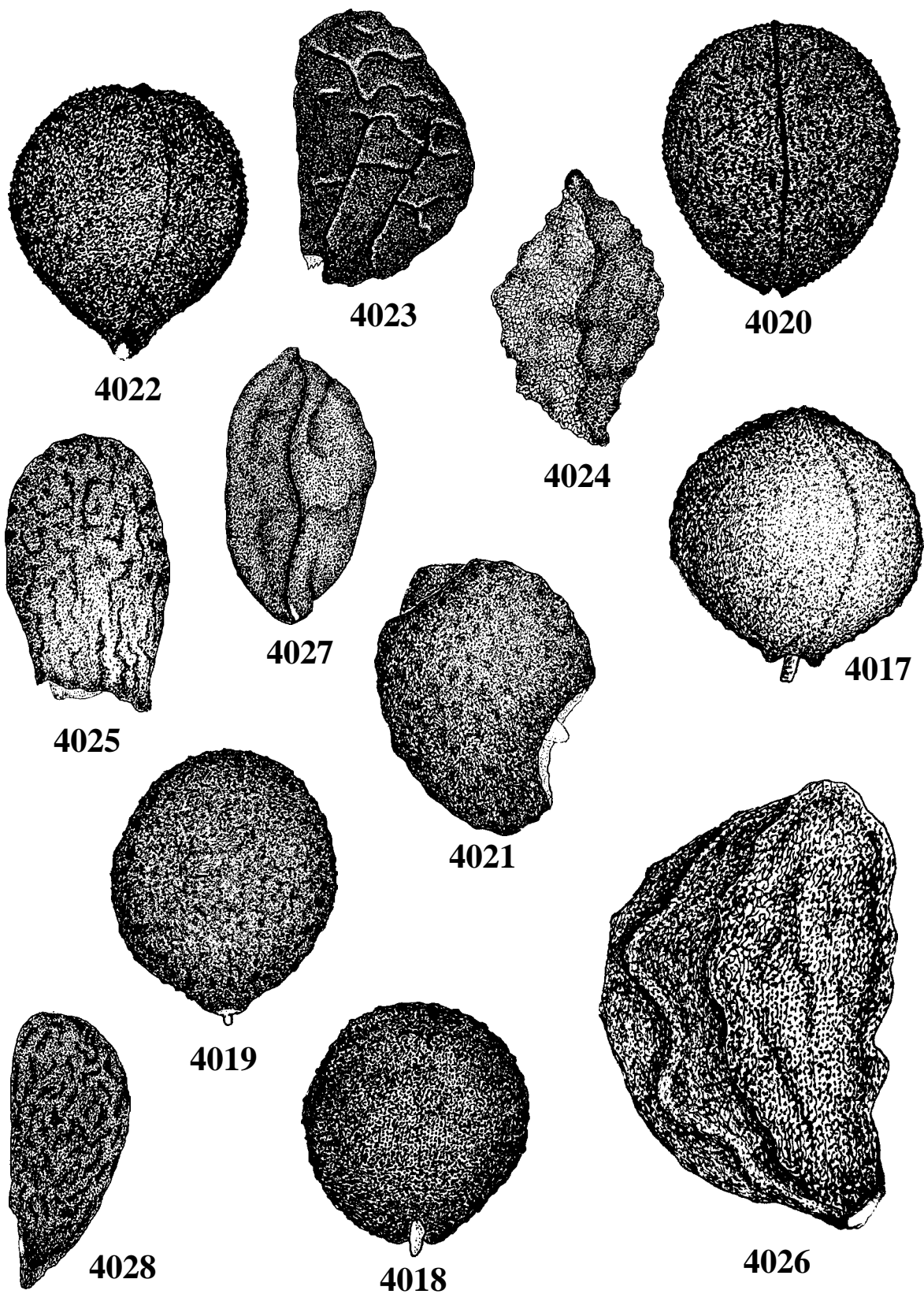
**4024. *Allium ampeloprasum* L.** subsp. *ampeloprasum* — Perennial or biennial, stems erect, 40-150 cm high, rough, oval, up to 1/3-1/2 enfolded in leafy scales, leaves linear up to 50 x 0.5-3 cm wide. **Seeds triangular, acute at both ends, 2.7-3.3 x 1.6-2 mm. Surface fine reticulate, wrinkly, slight lustrous, black.  $2n = 32$ .** Native to southern Europe; in the Carpathians rarely cultivated as a vegetable.

**4025. *Allium angulosum* L., *A. acutangulum* Schrad., *A. danubiale* Spreng.** — Perennial, bare, stems erect, 20-45 cm high, leafy below, angular above, leaves narrowly linear. **Seeds  $\pm$  cylindric, apex round off, lower part a little narrow with large hilum, 2-2.5 x 1.4-1.6 mm. Surface deep and broad wrinkly, lustrous, black.  $2n = 16$ .** Native to Euro-Siberia, moist meadows, fenland and grassy riverbanks; in all Carpathian territories.

**4026. *Allium atropurpureum* Waldst. et Kit.** — Perennial, stem 40-100 cm high, 3-7 leaves growing from one onion, broadly linear, paumbels multiflowers, 3-7 cm in diam. **Seeds lateral flattish, dorsal side arched, ventral rooflike with hilum on bottom part, 3-3.5 x 2-2.4 mm. Surface wrinkly, dense and indistinct reticulate, lustreless, black.  $2n = 16$ .** Native to southeastern Europe, on uncultivated areas, roadsides, pastures and cultivated grounds. Hu, Ro.

**4027. *Allium atrovioleaceum* Boiss.** — Perennial, stem strongly erect, 30-90 cm high, up to 1/3-1/2 with leafy sheaths, veiled, paumbel spherical, 3-6 cm in diam, multiflowers. **Seeds oval or broad spindleshaped, dorsal side roundish, ventral rooflike with rib and hilum, 2.6-2.8 x 1.4-1.6 mm. Surface wrinkly, fine reticulate, slight lustrous, black.  $2n = 16, 32, 48 (24)$ .** Native to Eurasia, rare in hill steppes and hay meadows. Hu, Ro, Sk.

**4028. *Allium carinatum* L., *A. flexum* Waldst. et Kit.** — Perennial, stem 20-60 cm high, up 1/2-3/5 with leafy sheaths, veiled, 2-4 leaves from one bulb. **Seeds one lateral side compressed, the latter roundish**



prolonged obovate, indistinct hilum at narrow bottom, 3.4-3.8 x 1.5-1.7 mm. Surface wrinkly, slight lustrous, black.  $2n = 16, 24, 32$ . Native to central and southern Europe, stony and shrubby slopes, saline meadows. Hu, Pl, Ro, Sk.

**4029. *Allium cepa* L., *A. ascalonicum* auct. non L.** — Biennial, perennial, stem up to 100 cm high, below half inflated and up to 2 cm in diam. **Seeds slight lateral compressed, dorsal side arched, ventral mostly rooflike, with hilum, 2.7-3.3 x 2.1-2.5 mm. Surface wrinkly, fine reticulate, greyish-brown.  $2n = 16, 32$ .** Native probably to central Asia; for long time cultivated throughout the world as a vegetable and for food industry in numerous cvs.

**4030. *Allium cyaneum* Rgl.** — Perennial, a minute plant, with narrow grassy leaves and blue flowers, stems 15-20 cm high. **Seeds obovate, 2.2-2.6 x 1.5-1.7 mm. Surface alveolate, lustrous, black.** Native to western China; in the Carpathians rarely planted for ornament in gardens.

**4031. *Allium decipiens* Fischer ex Schultes et Schultes fil.** — Perennial, stems 40-60 cm high, leaves 1-3, linear, umbels 2.5-5 cm in diam., few- or many-flowered. **Seeds obovate, lateral slight compressed, 2.9-3.3 x 2.1-2.3 mm. Surface wrinkly, lustreless, black.  $2n = 16$ .** Native to eastern Europe, steppes, rocky and grassy slopes, shrubberies. Br, Mo, Uk.

**4032. *Allium fistulosum* L.** — Perennial, stem 20-70 cm high, 2-3 cm in diam, lower half inflated. **Seeds semiglobular or multiform, dorsal side arched, one lateral side flat, the other convex, 3-3.5 x 2-2.3 mm. Surface smooth, slight lustrous, black.  $2n = 16$ .** Native to in Oriental Asia and Siberia; in the Carpathians rarely cultivated as a vegetable.

**4033. *Allium flavum* L.** — Perennial, stem erect, 10-70 cm high, glaucous, veiled, up to 1/3-1/2 with leafy sheaths, 2-3 leaves growing out from one bulb. **Seeds prolonged obovate, compressed, one lateral side flat, the other roundish, narrowed bottom with small hilum, 3-3.5 x 1.5-1.8 mm. Surface wrinkly, slight lustrous, black.  $2n = 16$ .** Native to central and southern Europe, sunny dry rocks, shrubby, stony or grassy slopes and sandbanks; in the Carpathians rarely cultivated in gardens. Au, Hu, Mo, Ro, Sk, Uk.

**4034. *Allium guttatum* Steven, *A. margaritaceum* Sibth. et Son.** — Perennial, stems solitary, rarely manifold, 20-100 cm high, inflorescence below dilated.

**Seeds spindle-shaped, triangular, acute at both ends, 2.5-2.8 x 1.1-1.3 mm. Surface wrinkly, faint lustrous or dull, black.  $2n = 16$ .** Native to the Balkan Peninsula, southeastern Europe, hill-slopes, rocky places, sandy dunes and littoral coasts. Mo, Pl, Ro, Uk.

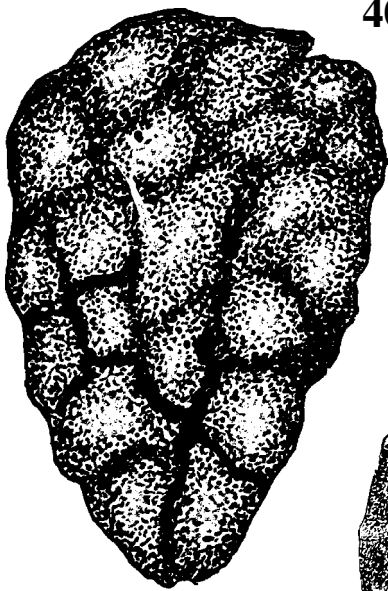
**4035. *Allium karataviense* Regel** — Perennial, stems with exotic appearance, 15-20 cm high, inflorescence spherical, leaves broad, like in tulip, flowers fleshy-red, with dark middle veins on flower petals. **Seeds obovate, 2.8-3 x 2.2-2.4 mm. Surface reticulate, slight lustrous, black.** Native to Turkestan; in the Carpathians rarely cultivated for ornament in rock-gardens.

**4036. *Allium lineare* L., *A. strictum* Schrad.** — Shrub, stems 25-60 cm high, slightly ribbed, leaves linear, solid, ribbed beneath, with denticulate margins, umbel many-flowered, dense. **Seeds oblong oval, dorsal side convex, ventral rooflike with flat sides, 3.5-4 x 1.5-1.8 mm. Surface wrinkly, lustrous, black.  $2n = 16, 48$ .** Native to Europe, rocky slopes, mountain grasslands and steppes. Pl, Ro, Sk, Uk.

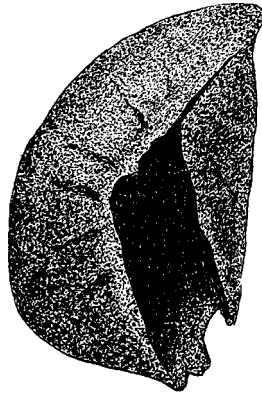
**4037. *Allium moly* L.** — Perennial, stem 15-35 cm high, roundish, 1-3 leaves growing out from one bulb. **Seeds very variable, more or less angular, dorsal side roundish, ventral angular, rooflike with white hilum in the centre or at margin, 3-3.4 x 2.4-2.7 mm. Surface wrinkly, dull, black.  $2n = 14$ .** Native to the Mediterranean; in the Carpathians rarely cultivated as a permanent ornamental plant, escaping exceptionally.

**4038. *Allium montanum* F. W. Schmidt, *A. senescens* L. subsp. *montanum* (Fries) Holub, *A. falax* Roem. et Schult.** — Perennial, stems erect, 20-50 cm high, angular paumbel semiglobular, 2-5 cm in diam., multiflowered. **Seeds obovate, lateral flat-tish, bottom with hilum, 2.5-3 x 1.7-2 mm. Surface wrinkly, reticulate, lustrous, black.  $2n = 16, 24, 32, 48$ .** Native to Europe, stony, calcite, also granite and sandy grounds of montane and alpine zones. Au, Hu, Pl, Ro, Sk, Uk.

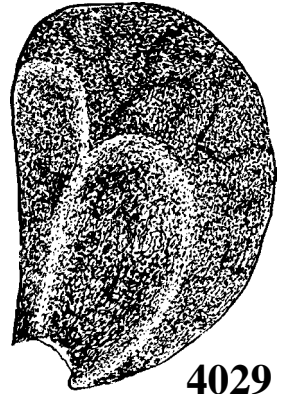
**4039. *Allium moschatum* L., *A. setaceum* Waldst. et Kit.** — Perennial, stem 10-40 cm high, ascendent or erect, roundish, glaucous, smooth, 3-6 leaves emerging from one bulb. **Seeds mostly spindle-shaped or oval, with or only slight indistinct hilum, 2.6-3 x 1.4-1.6 mm. Surface coarse wrinkly, lustrous, black.  $2n = 16$ .** Native to Eurasia, calcite



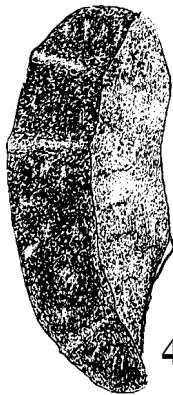
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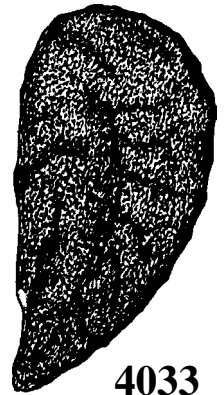
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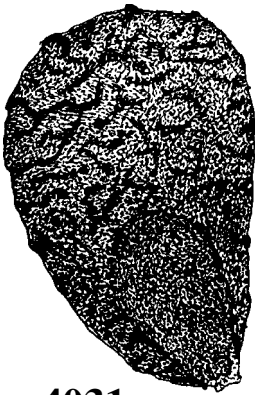
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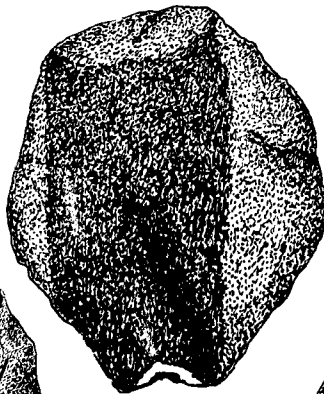
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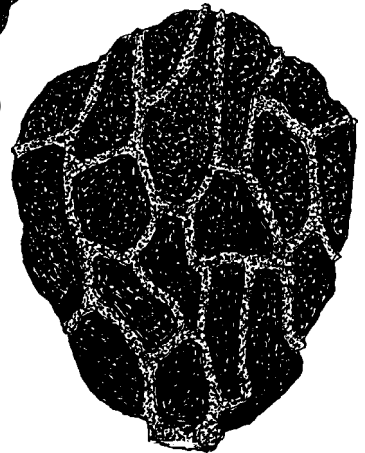
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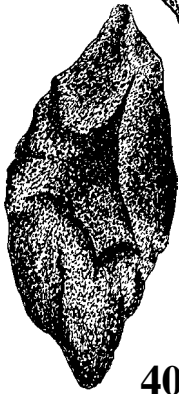
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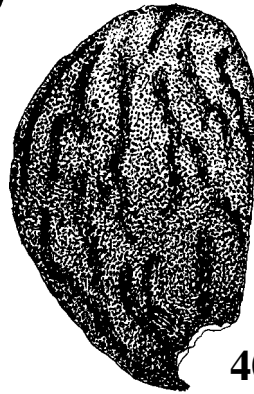
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and dolomite, sunny and stony slopes in arid areas. Hu, Mo, Ro, Uk.

**4040. *Allium narcissiflorum*** Vill., *A. pedemontanum* Willd. — Perennial, stems up to 30 cm high, leaves grassy, inflorescence consisting only of 4-8 big pink flowers. **Seeds elliptic, dorsal side convex, ventral flattish or concave, 3.1-3.7 x 2.2-2.6 mm. Surface ruminate, slight lustrous, black.** Originally growing in the Italian Alps, stony and gravelly places; in the Carpathians cultivated as the nicest species of *Allium* in rock-gardens.

**4041. *Allium obliquum*** L. — Perennial, stem strong, glabrous, striate, 30-150 cm high, inflorescence multi-flowered, 25-35 mm in diam. **Seeds spindle-shaped, triangular in section, dorsal side with broad longitudinal depression, ventral rooflike with indistinct hilum, 3.5-4 x 1.7-2 mm. Surface slight wrinkly, reticulate, lustrous, black. 2n = 16.** Native to Eurasia, calcite stony slopes and steep rocks. Ro, Uk.

**4042. *Allium ochroleucum*** Waldst. et Kit., *A. ericetorum* Thore, *A. xanthicum* Griseb. et Schur — Perennial, stem erect, 10-40 cm high, longitudinally striate, glabrous. **Seeds spindle-shaped, dorsal side oval, ventral rooflike with suture and hilum, 3.8-4.2 x 1.6-1.8 mm. Surface wrinkly, lustrous, black. 2n = 16, 32.** Native to Europe, overgrown sunny, shady calcite rocks, stony slopes of the montane zone. Br, Mo, Pl, Ro, Sk, Uk.

**4043. *Allium odorum*** L. — Perennial, stem 15-50 cm high, oval, slightly angular only in upper part, leafy at base. **Seeds semispherical, lateral compressed, dorsal side narrow-arched, ventral side narrow rooflike, apex tipped, 3.7-4.1 x 2.4-2.6 mm. Surface strong wrinkly, lustrous, black. 2n = 16.** Native to Asia; in the Carpathians rarely cultivated in gardens as a permanent, large-flowered ornamental form (*tuberosum* Roxn.), rarely escaping.

**4044. *Allium oleraceum*** L. — Perennial, stem 25-100 cm high, more than its half veiled, with leafy sheaths, 2-4 leaves from one bulb. **Seeds obovate, one lateral side flat, the other roundish, bottom with whitish small hilum, 3.3-3.8 x 2.6-2.8 mm. Surface wrinkly, lustrous, greyish-black. 2n = 32.** Native to Europe, stony and shrubby slopes, vineyards, fields, boundaries, light and sandy woods and their margins. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4045. *Allium oreophillum*** C. A. Mey., *A. ostrowskianum* Regel — Perennial, stems 15-20 cm high, leaves narrow, flowers relatively big, pink or reddish. **Seeds obovate, apex roundish, bottom gradually narrowed, 2.5-2.8 x 2-2.2 mm. Surface waved, lustrous, black.** Native to Turkestan, sunny and dry, calcareous soils; in the Carpathians cultivated in rock-gardens.

**4046. *Allium paczoskianum*** Tuzson, *A. pulchellum* G. Don fil. — Perennial, stems up to 30-40 cm high, inflorescence many-flowered, decomposed. **Seeds obovate, lateral compressed, apex roundish, bottom narrow and a little bended, 3.1-3.5 x 1.6-1.8 mm. Surface fine granulate, faint lustrous, black.** Native to southeastern Europe, steppes, grassy and stony slopes, woody steppes. Mo, Ro, Uk.

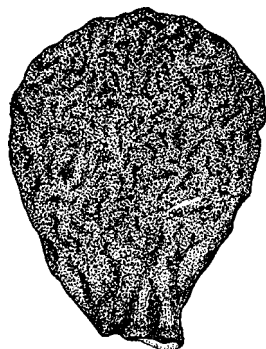
**4047. *Allium paniculatum*** L. — Perennial, stem 30-70 cm high, roundish, up to 1/3-1/2 with leafy sheath veiled, paumbel plenty of flowers without bulblets. **Seeds obovate, slight lateral flattish, with large hilum below, 2.6-3 x 1.8-2 mm. Surface wrinkly, fine reticulate, slight lustrous, black. 2n = 16.** Native to southern Eurasia, on light woods, sunny shrubberies, karst steppes, sandy dunes, arid stony and rocky slopes. Hu, Mo, Ro, Sk, Uk.

**4048. *Allium paradoxum*** (M. Bieb.) G. Don, *Scilla paradoxa* M. Bieb. — Perennial, stem feeble, 15-30 cm high, 1-2 leaves growing out of one bulb, paumbels usually with only one flower but numerous green bulblets. **Seeds spherical, lateral slight flattish, with large whitish hilum on ventral side, 2.5-3 x 2.2-2.6 mm. Surface wrinkly, slight lustrous or dull, black. 2n = 16.** Originally growing in the Caucasus; previously very rarely cultivated in gardens, escaping and naturalized.

**4049. *Allium podolicum*** Blocki ex Racib. et Szafer et al. — Perennial, stems 15-50 cm high, leaves filiform, sheathing the lower half or even more of the stem. **Seeds spindle-shaped, ± triangular, 4.4-4.8 x 2-2.3 mm. Surface alveolate, faint lustrous, black.** Native to central and eastern Europe, dry steppes, stony slopes and light forests. Mo, Pl, Ro, Uk.

**4050. *Allium porrum*** L. — Biennial to perennial, stem 50-150 cm high, erect, glabrous, glaucous, 10-12 mm in diam., inflorescence multiflowered, spherical, 5-12 cm in diam. **Seeds ovate, obovate or broad spindle-shaped, dorsal side ± flat,**

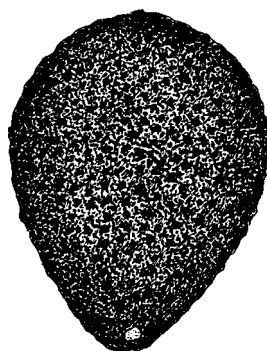




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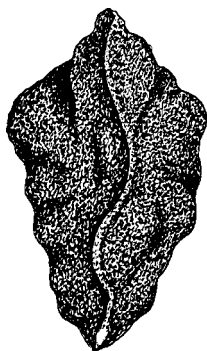
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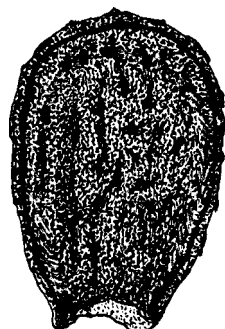
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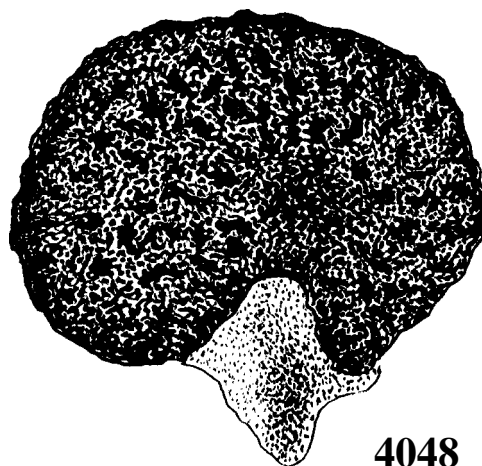
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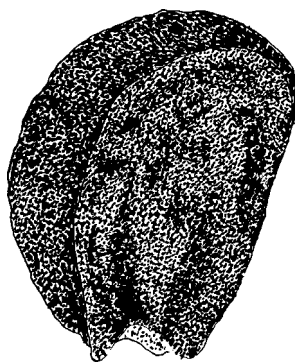
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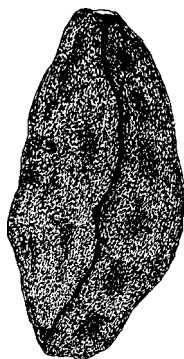
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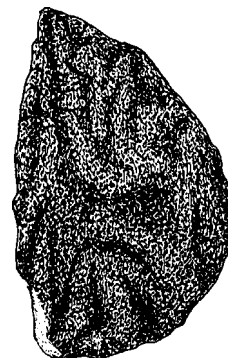
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ventral rooflike with longitudinal rib and hilum, 2.9-3.5 x 1.7-2 mm. Surface wrinkly, smooth or indistinct reticulate, slight lustrous, black.  $2n = 32$ . Cultivated taxon selected from *A. ampeloprasum*; grown as a vegetable in gardens and fields in a number of cvs, uniquely and transiently naturalized.

**4051. *Allium rotundum* L.** — Perennial, stems 20-60 cm high, glabrous, bottom striate, glabrous later on. **Seeds elliptic or spindleshaped, dorsal side roundish, ventral rooflike with rib and hilum, 2.5-3 x 1.4-1.6 mm. Surface wrinkly indistinct reticulate, slight lustrous, black.  $2n = 16$  (32).** Native to southern and central Europe, sunny and stony slopes, light woods, sandbanks, vineyards, secondary in fields and fallows. Hu, Mo, Pl, Ro, Sk, Uk.

**4052. *Allium salota* Dostál, *A. ascalonicum* Strand et Mansf. non L.** — Perennial, stems erect, leafy only below, leaves hollow, pipely, shorter than the stem. **Seeds  $\pm$  ovate, lateral compressed, apex gradually narrowed, bottom  $\pm$  roundish, with hilum on one side, 3.6-4.3 x 2.3-2.7 mm. Surface waved, faint lustrous, black.  $2n = 16$ .** Native to Siberia; in the Carpathians cultivated as a vegetable for many years.

**4053. *Allium sativum* L.** — Perennial, stem 25-100 cm high, veiled with leafy sheaths up to half, 6-12 leaves growing out of one onion. **Seeds semiovoid, compressed on one lateral side, the other roundish angular, 2.8-3.2 x 1.8-2.1 mm. Surface wrinkly, fine reticulate, slight lustrous, black.  $2n = 16$ .** Native probably to central Asia; in the Carpathians commonly cultivated in numerous cvs as a vegetable in gardens and fields, rarely escaping into humous heaps and fields in all Carpathian territories.

**4054. *Allium saxatile* M. Bieb., *A. globosum* M. Bieb. ex Redouté, *A. marschallianum* Wed.** — Perennial, stems 10-70 cm high, leaves sheathing the lower 1/3 or less of the stem. **Seeds elliptic, dorsal side rooflike or convex, ventral flat or concave, 3.3-3.8 x 2.1-2.3 mm. Surface glossy, greyish-black.  $2n = 16$ .** Native to southeastern Europe, rocky slopes and steppes. Mo, Ro.

**4055. *Allium schoenoprasum* L.** subsp. *schoenoprasum* — Perennial, stems 5-50 cm high, erect, hollow, 1-2 leaves emerging from bulb. **Seeds spindleshaped, lateral flattish, dorsal side narrow, round, ventral narrowly rooflike with hilum in the centre, 2.8-3 x 1.2-1.4 mm. Surface rough wrinkly,**

**fine reticulate, lustrous, black.  $2n = 16$ .** Native to Europe, coastal shrubberies and lawns along larger streams; often cultivated as a vegetable in gardens. Br, Hu, Pl, Ro, Sk, Uk.

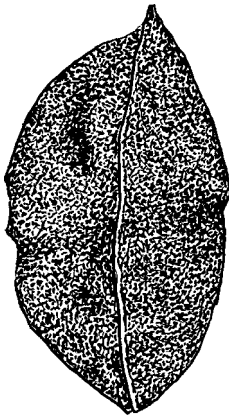
**4056. *Allium schoenoprasum* L., *A. schoenoprasum* subsp. *alpinum* DC., *A. sibiricum* L.** — Perennial, stems 20-50 cm high, bottom part sparsely leafy, flowers pink. **Seeds planoconvex, ventral side flattish, bottom truncate, 2-2.5 x 1.6-1.9 mm. Surface mostly longitudinal sinuate, lustrous, black.  $2n = 16, 42$ .** Native to alpine and circumpolar positions, on moist meadows, springheads, wetty rocks, on acid, humous stands; in the whole Carpathians.

**4057. *Allium scorodoprasum* L.** — Perennial, stems 50-100 cm high, leaves linear, 5-20 mm wide, shortly downy at margin and on leaf beneath veinous. **Seeds elliptic, dorsal side convex, ventral side rooflike, longitudinal sharp angular, 2.3-2.7 x 1.4-1.6 mm. Surface waved lustrous, black.  $2n = 16, 24, 32$ .** A cultural taxon, very often cultivated in gardens as a vegetable in the past, presently considerably widespread in light lowland woods; in all Carpathian territories.

**4058. *Allium senescens* L.** — Perennial, stems 20-40 cm high, leaves (6-8) bristly, 0.5-1.5 mm wide, rough. **Seeds  $\pm$  halfmoon or ovate, lateral compressed, 3.4-4 x 2.4-2.8 mm. Surface irregular reticulate, lustrous, black.  $2n = 16$ .** Native to Euro-Siberia and the Balkan Peninsula, steppes, stony sites, sand-dunes, arid pastures and shrubby places. Mo, Pl, Ro, Uk.

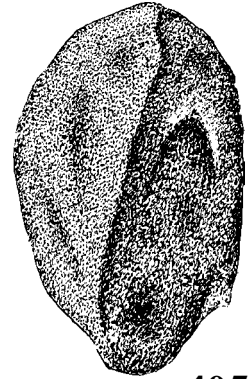
**4059. *Allium sphaerocephalon* L.** — Perennial, stem 30-90 cm high, veiled up to its 1/4-1/2 with leafy sheaths, 2-6 leaves growing out of one onion. **Seeds ovate or oval, dorsal side roundish, ventral rooflike with longitudinal rib and hilum, 2.5-3 x 1.3-1.5 mm. Surface wrinkly, reticulate, dark-brown.  $2n = 16$  (18).** Native to Europe, sunny and rocky slopes, vineyards, secondary in fields and fallows. Hu, Mo, Pl, Ro, Sk, Uk.

**4060. *Allium suaveolens* Jacq.** — Perennial, stems 20-60 cm high, terete, leaves (2-5) up to 40 cm x 1.5-3 mm, sheathing the lower 1/4-1/3 of the stem, linear. **Seeds spindle-shaped, oblong, transversal section  $\pm$  triangular, dorsal side flat, ventral rooflike, 3.5-3.9 x 1.4-1.6 mm. Surface rough, smooth, slight furrowed, black.  $2n = 16$ .** Native to Albania and northern Italy, damp meadows and moors. Hu.

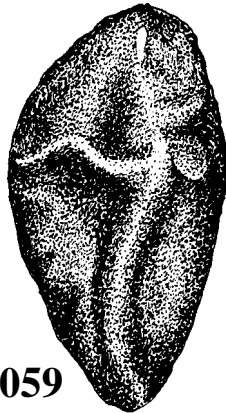


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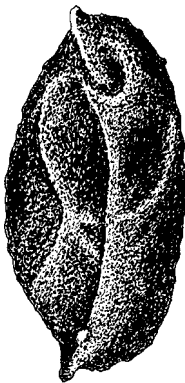
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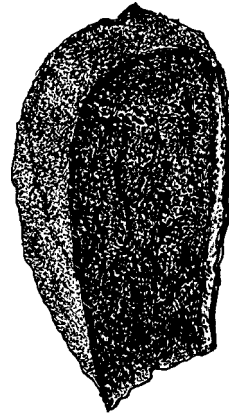
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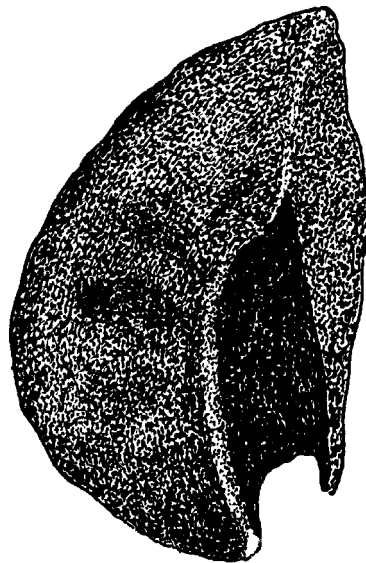
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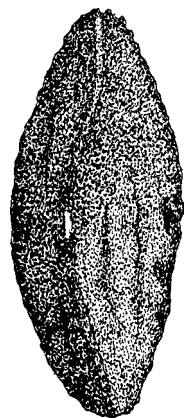
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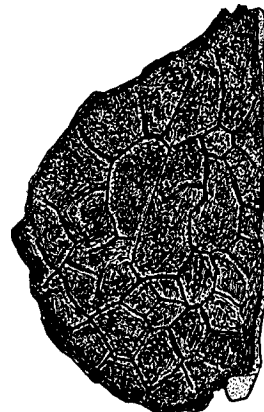
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**4061. *Allium ursinum* L.** — Perennial, stem 10-50 cm high, below 2-, above 3-angular up to round, 2-3 leaves growing out of one bulb. **Seeds  $\pm$  spherical, truncate below with broad hilum, 2.2-2.6 x 2.1-2.3 mm. Surface wrinkly, lustreless, black.  $2n = 14$ .** Native to Europe, in shady, moist woods, beech and lowland forests, forest riverbanks, dwarf pine areas; throughout the Carpathians.

**4062. *Allium victorialis* L.** — Perennial, stem erect, 30-60 cm high, round, weakly 2-angular below. **Seeds  $\pm$  spherical with two or three longitudinal ribs, bottom truncate with white hilum, 2.4-2.7 x 2.2-2.5 mm. Surface wrinkly, lustrous, black.  $2n = 16$ .** Native to Europe, dwarf pine sites, overgrown rocky valleys, mountain floodplains, beech woods of montane to alpine zones. Br, Hu, Pl, Ro, Sk, Uk.

**4063. *Allium vineale* L.** — Perennial, stem 30-100 cm high, veiled up to its 1/3-1/2 with leafy sheaths, 2-4 leaves from one onion, paumbel semispherical, 2-5 cm in diam. **Seeds ovoid, one lateral side flat, the other slight round, with whitish hilum at edge, 3.5-4 x 2.2-2.6 mm. Surface wrinkly, smooth, lustrous, black.  $2n = (16), 23 (48)$ .** Native to Europe, sunny, shrubby slopes and rocks, light, dry shrubberies, secondary in vineyards, fields and fallows; throughout the Carpathians.

**4064. *Convallaria majalis* L.** — Perennial, peduncle erect, 10-30 cm high, flowers in unilateral racemes, with drooping, aromatic white flowers. **Seeds semiglobular, one lateral side compressed, the other round, hilum on ventral side dark-brown with whitish centre, 3.5-4 x 2.7-3.3 mm. Surface glabrous, lustrous, yellowish-brown.  $2n = 38 (26, 32, 34, 36)$ .** Native to Eurasia, woods of various kinds, rich in humous and plant nutrients; in all Carpathian regions.

**4065. *Nectaroscordum dioscoridis* (Sibth. et Sm.) Zahar., *N. siculum* subsp. *bulgaricum* (Janka) Stearn, *Allium dioscoridis* auct. non Sibth. & Sm.** — Perennial, stems 10-150 cm high, erect, glabrous, green, umbel many-flowered - inflorescence with 20-60 flower, lax. **Seeds trihedral or triangular, lateral strong compressed, dorsal side roundish, ventral straight, rooflike, 3.7-4.3 x 2.4-3.2 mm. Surface scabrous, dense punctuate, shallow ribbed, dull, black.  $2n = 18$ .** Native to Eurasia (Balkan countries and Asia Minor), damp, shady and moist leafy woods. Mo, Ro.

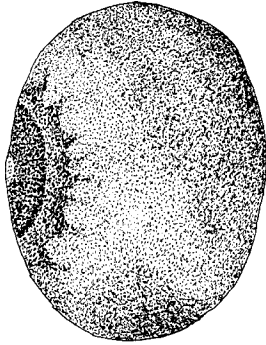
**4066. *Maianthemum bifolium* (L.) F. W. Schmidt, *Convallaria bifolia* L.** — Perennial, stem erect, 5-25 cm high, scarcely downy, angular, raceme pedunculate. **Seeds spherical, with flat area on one side, apex with small humplet (rest of the style) with whitish and dark-brown rings around, 2.2-2.6 x 2-2.2 mm. Surface glabrous, lustreless, pale-orange.  $2n = 36 (28, 42)$ .** Native to Eurasia, shady woods and shrubberies, lowland forests, meadows, overgrown rocks, dwarf pine sites; grows mostly in colonies in all Carpathian regions.

**4067. *Streptopus amplexifolius* (L.) DC., *S. distortus* Michx.** — Perennial, stem erect, 20-100 cm high, flower single, peduncle c. 5 cm long. **Seeds cymbiform, apex truncate, bottom gradually narrowed, 3.2-3.5 x 1.3-1.5 mm. Surface longitudinal furrow, slight lustrous, yellowish to pale-orange.  $2n = 32$ .** Native to Europe, shady and moister woods, overgrown rocks, alpine meadows and dwarf pine areas. Pl, Ro, Sk, Uk.

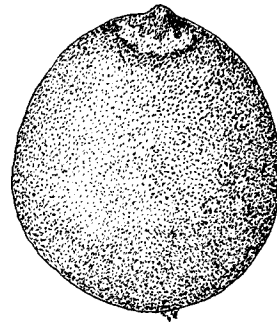
**4068. *Polygonatum latifolium* (Jacq.) Desf., *Convallaria latifolia* Jacq.** — Perennial, stems erect, 20-100 cm high, angular, downy above. **Seeds  $\pm$  spherical, one side and apex compressed, truncate with small humplet and white and dark-violet rings around, 3.4-4.2 x 3.1-3.7 mm. Surface glabrous, lustrous, pale-brown.  $2n = 20$ .** Native to Eurasia, warm, leafy woods and shrubberies, lowland forests. Hu, Mo, Pl, Ro, Sk, Uk.

**4069. *Polygonatum multiflorum* (L.) All., *Convallaria multiflora* L.** — Perennial, stems 30-80 cm high, erect, bare, leaves alternate, ovoidal up to lanceolate. **Seeds  $\pm$  spherical, compressed from one side, apex truncate with large dark-brown spot and small hump, 3.4-4.2 x 2.9-3.5 mm. Surface glabrous, spotted white, slight lustrous or dull, dirty-orange.  $2n = 18, 20, 24, 28, 30, 32$ .** Native to Eurasia, shady, leafy woods, overgrown rocks, coastal shrubberies throughout the Carpathians.

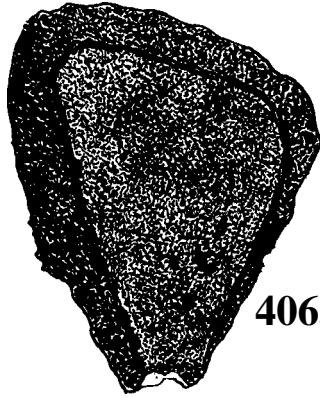
**4070. *Polygonatum odoratum* (Mill.) Druce, *P. officinale* All.** — Perennial, stems erect or bowly ascendent, angular, bare, leaves alternate. **Seeds  $\pm$  spherical, apex truncate with dark-brown spot and small humplet, 3-4 x 2.8-3.4 mm. Surface glabrous with white spots, lustreless, dirty pale-brown.  $2n = 20 (26, 28, 29, 30)$ .** Native to Eurasia, light woods and shrubberies, forest margins, stony slopes and rocks, dryer meadows, sandy pine forests; in all Carpathian regions.



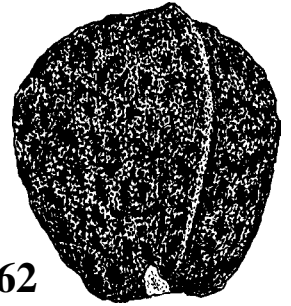
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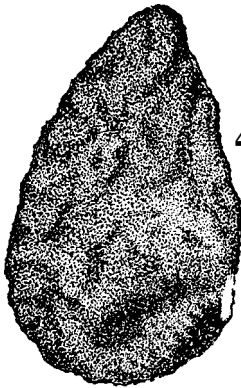
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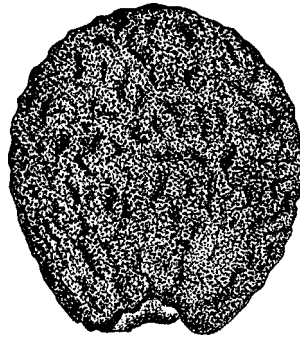
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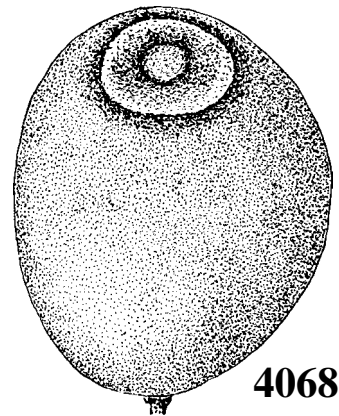
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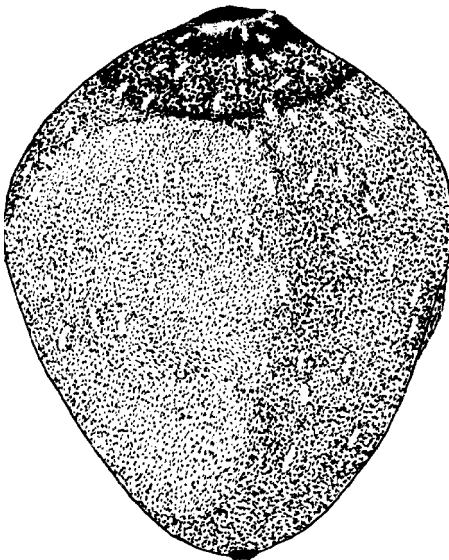
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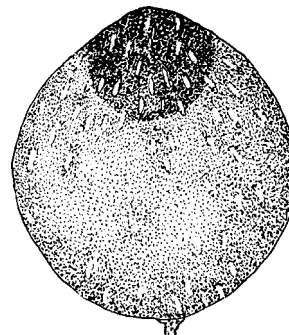
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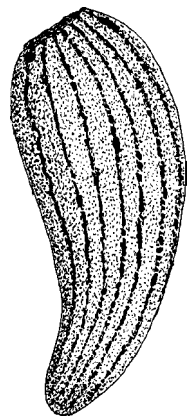
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**4071. *Polygonatum verticillatum* (L.) All., *Convallaria verticillata*** — Perennial, stems erect, 20-80 cm high, angular, bare, rarely downy, middle and upper leaves in whorls, flowers in leaf axils. **Seeds  $\pm$  spherical, apex with humplet surround with white and brown rings, 3-3.6 x 2.8-3.4 mm. Surface glabrous, high lustrous, orange.  $2n = 28$  (24, 30, 60, 64, 84, c. 90).** Native to Eurasia, shady woods and shrubberies, mountain meadows. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4072. *Paris quadrifolia* L.** — Perennial, stem erect, 10-40 cm, with whorl above, 4-8 broadly ellipsoidal leaves. **Seeds obovate or oval, 2-4 round off, angular, apex truncate with ring stain as the rest of style, 2.5-3 x 1.8-2 mm. Surface longitudinal ribbed and furrowed, dull, violet-brown, often purplish punctate.  $2n = 20$ .** Native to Euro-Siberia, leafy and lowland woods, coastal shrubberies of lowland up to montane zones; in all Carpathian territories.

**4073. *Gloriosa rothschildiana* O'Brien** — Perennial, beautiful herbaceous twiner, stems branched later on, with crimson and yellow, large flowers. **Seeds  $\pm$  spherical, planoconvex, ventral side with round, black hilum, 4-4.5 mm in diam. Surface punctate, lustreless, cinnamon-brown, hilum surround, by darker-brown collar.** Native to tropical Asia and Africa; in the Carpathians rarely cultivated in flower-gardening hot-houses, for its very attractive flowers used for bouquets.

**4074. *Gloriosa superba* L.** — Perennial, plant in growth very similar to *G. rothschildiana*, flowers hilumlet and yellow. **Seeds spherical, globose to obpyriform, ventral side with hilum, 4.2-4.7 x 3.8-4.2 mm. Surface of hilum covered with short and tight fitting hairs.** Native to Sri Lanka, tropical Asia and Africa. Exploitation similar to *G. rothschildiana*.

**4075. *Asparagus brachyphyllus* Turcz., *A. pallasii* Misch.** — Perennial, stems 1-4, feeble, ascendent or erect, 25-80 cm high. **Seeds spherical or elliptic, dorsal side roundish, ventral truncate with deflexed hilum, lateral side flat, 3.3-3.9 x 3-3.5 mm. Surface smooth or fine wrinkly, slight lustrous, black.  $2n = 40$ .** Native to southeastern Europe, moist saline grounds and sandy littoral areas. Mo, Ro, Uk.

**4076. *Asparagus maritimus* (L.) Mill., *A. scaber* Hoffm., *A. levinae* Klokov, *A. pseudosaber* Grec.** — Perennial, stem and branches longitudinally striate-papillose, berry with 2-6 seeds. **Seeds  $\pm$  spherical**

**or oval, horizontal slight compressed, dorsal side roundish, ventral  $\pm$  flat, central part concave, 3.3-4 x 3-3.5 mm. Surface very fine reticulate, slight lustrous, black.** Native to southeastern Europe, moist depressions, saline stands, littoral sandbanks, light forests on hills. Mo, Ro, Uk.

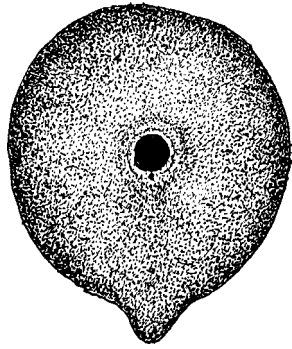
**4077. *Asparagus officinalis* L., *A. tenuifolius* auct. non Lam.** — Perennial, herbaceous, stem and branches smooth, nodular, with 1-3 flowers, berry red, with 1-6 seeds. **Seeds  $\pm$  spherical or oval, horizontal compressed, dorsal side convex, ventral flat with yellowish hilum, 2.8-3.5 x 2.8-3.2 mm. Surface fine reticulate smooth, slight lustrous, black.  $2n = 20$ .** Native to Eurasia, grassy and shrubby slopes, coastal shrubberies, humous woods and vineyards, moist stands of warmer areas; throughout the Carpathians cultivated as a vegetable.

**4078. *Asparagus plumosus* Baker** — Perennial, stems feeble, glabrous, bare, erect from base, thorny, abundantly branched, 50-200 cm long, pendulous. **Seeds spherical on dorsal, ventral and lateral sides, hilum indistinct or distinct only very slight, 2.7-3.2 x 2.7-3.2 mm. Surface glabrous or faint wrinkly, slight lustrous, black.** Originally growing in southern Africa; introduced into the Carpathians and cultivated as a permanent ornamental plant in dwellings.

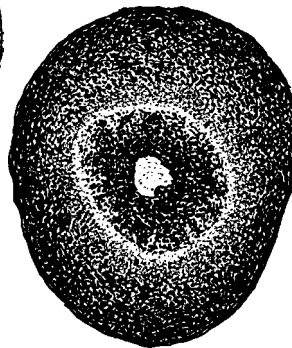
**4079. *Asparagus polyphyllus* Stev.** — Perennial, stems 30-60 cm high, berry dark-red. **Seeds ellipsoid, horizontal compressed, planoconvex, sometimes with 2 flat areas, 3-3.5 x 2.2-2.6 mm. Surface minute waved, slight lustrous, black.** Native to southeastern Europe, steppes, dry meadows and open areas. Mo, Uk.

**4080. *Asparagus sprengeri* Regel.** — Perennial, stem procumbent or voluble, 40-200 cm long, glabrous, inflorescence raceme 1.5-7 cm long, berry reddish. **Seeds spherical, with yellowish to purple hilum at bottom, 4-4.5 mm in diam. Surface humpy or smooth, faint lustrous, black.** Native to southern Africa; in the Carpathians often cultivated as a permanent plant in pots, rarely in parks.

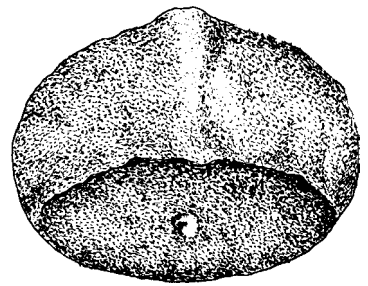
**4081. *Asparagus tenuifolius* Lam., *A. silvaticus* Waldst. et Kit.** — Perennial, stems up to 100 cm high, herbaceous, erect, stems and branches smooth, nodular, with 1-2 flowers, berry with 2-6 seeds. **Seeds spherical, horizontal compressed, dorsal side convex, ventral flat, 3.3-3.8 x 2.8-3.1 mm. Surface fine reticulate, smooth, slight lustrous, black, hilum**



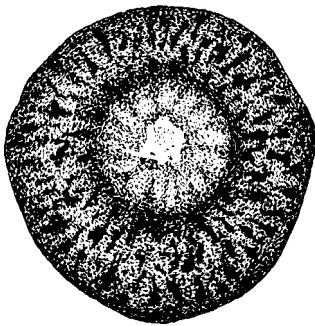
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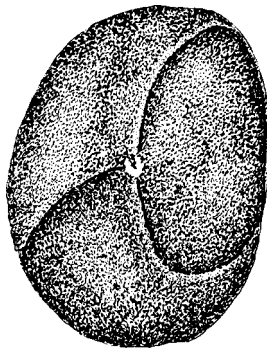
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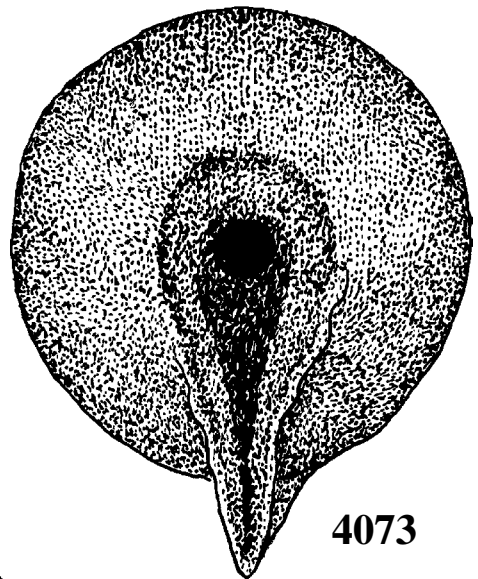
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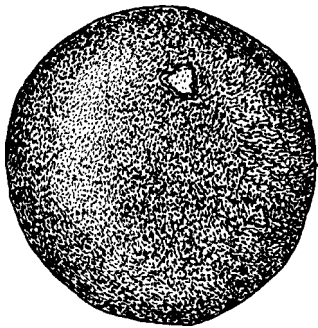
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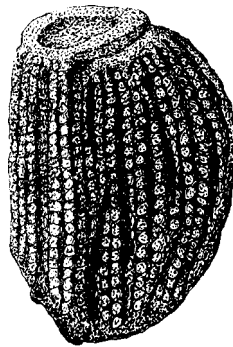
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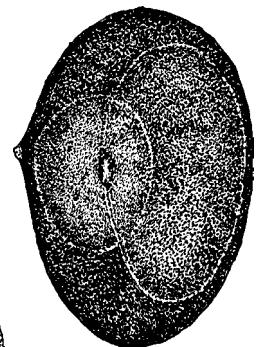
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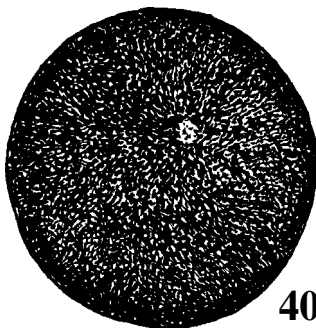
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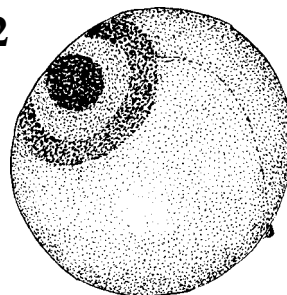
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**whitish. 2n = 20.** Native to southern and southcentral Europe; woods, cut-over areas and shrubberies. Hu, Mo, Pl, Ro, Uk.

**4082. *Asparagus verticillatus* L.** — Perennial, stems 70-150 cm high, branches patent or deflexed, strongly sulcate, smooth to papillose, 3-angular. **Seeds ± spherical or oval, 1-3 seeds in one fruit, 5-5.5 x 4-4.4 mm. Surface ruminate, faint lustrous, black. 2n = 16.** Native to southeastern Europe, felled areas, shrubberies, grassy and stony slopes and sea shores. Mo, Ro, Uk.

**4083. *Ruscus aculeatus* L.** — Perennial, stems 20-70 cm high, erect, rigid, abundantly branched, flower raceme short, with 1-5 flowers. **Seeds spherical, one lateral side usually flat, truncate apex having brown stain as the rest of style, 6.5-7.5 x 6-6.6 mm. Surface glabrous, dull, arenaceous. 2n = 40.** Native to Europe and northern Africa, rare in woods, cut-over areas, shrubberies and rocky areas. Hu, Ro.

**4084. *Ruscus hypoglossum* L., *R. hypophyllum* L. subsp. *hypoglossum* (L.) Domin** — Perennial, evergreen, 20-40 cm high, stems erect, ± non-branched, leaves scaly, lanceolate. **Seeds spherical or oval, one side usually flat, apex with brown stain as the rest of style, bottom hilum indistinct, 5-9 x 4-8 mm. Surface smooth, lustreless, arenaceous. 2n = 40.** Native to Eurasia, light woods and shrubberies. Hu, Ro, Sk, Uk.

## 165. SMILACACEAE

**4085. *Smilax aspera* L., *S. mauritanica* Poir., *S. nigra* Willd.** — Perennial, climbing or scrambling herbs, often woody below, angled, prickly, unarmed, leaves alternate, rounded to sagittate at base. Berry red or black. **Seeds spherical or elliptic in membranous cover, apex with small beak, bottom with roundish hilum, 3.8-4.2 x 3.6-4 mm. Surface smooth, lustrous, brown. 2n = 32.** Native to southern Europe, southwestern Asia and northern Africa, shrubberies and wood margins; rarely cultivated in the Carpathians in botanical gardens.

## 166. AGAVACEAE

**4086. *Agave americana* L.** — Perennial, central rosette massive, created with 30-60 ascending leaves, 100-150 x 15-25 cm, flowering stems strong, upper part with 20-40 twigs, 4-10 m high, berry red or black. **Seeds semispherical, lateral strong compressed,**

**winged around, 8.5-10.5 x 6.5-7.5 mm. Surface very faint longitudinal striate, lustrous, black. 2n = 32.** Native to tropical America (Mexico); in the Carpathians rarely cultivated as an ornamental in greenhouses or apartments.

**4087. *Yucca aloifolia* L.** — Perennial, trunk long, simple or branched, inflorescence up to 6 m high, leaves serrate, scabrous. **Seeds obovoid to triangular, lateral compressed, apex slight truncate, hilum indistinct, narrow winged around, 5.7-6.7 x 5-5.6 mm. Surface rugose or scabrous, slight lustrous, brownish-black or black.** Native to Mexico and the southern part of the USA; cultivated in the warmest parts of the Carpathians, mostly in flowerpots, gardens and parks, as a permanent ornamental plant.

**4088. *Yucca filamentosa* L.** — Perennial, shortly stoloniferous, scapose herb, with tufts or suberect, slightly glaucous leaves 45-60 x 4-5 cm, with whitish margins, fruits dehiscent. **Seeds semispherical, lateral strong compressed, 7.5-8.5 x 5.6-6.2 mm. Surface longitudinal interrupted, furrowed and ribbed, slight lustrous, black.** Native to the eastern part of the USA; very rarely cultivated in the warmest parts of the Carpathians, usually in flowerpots.

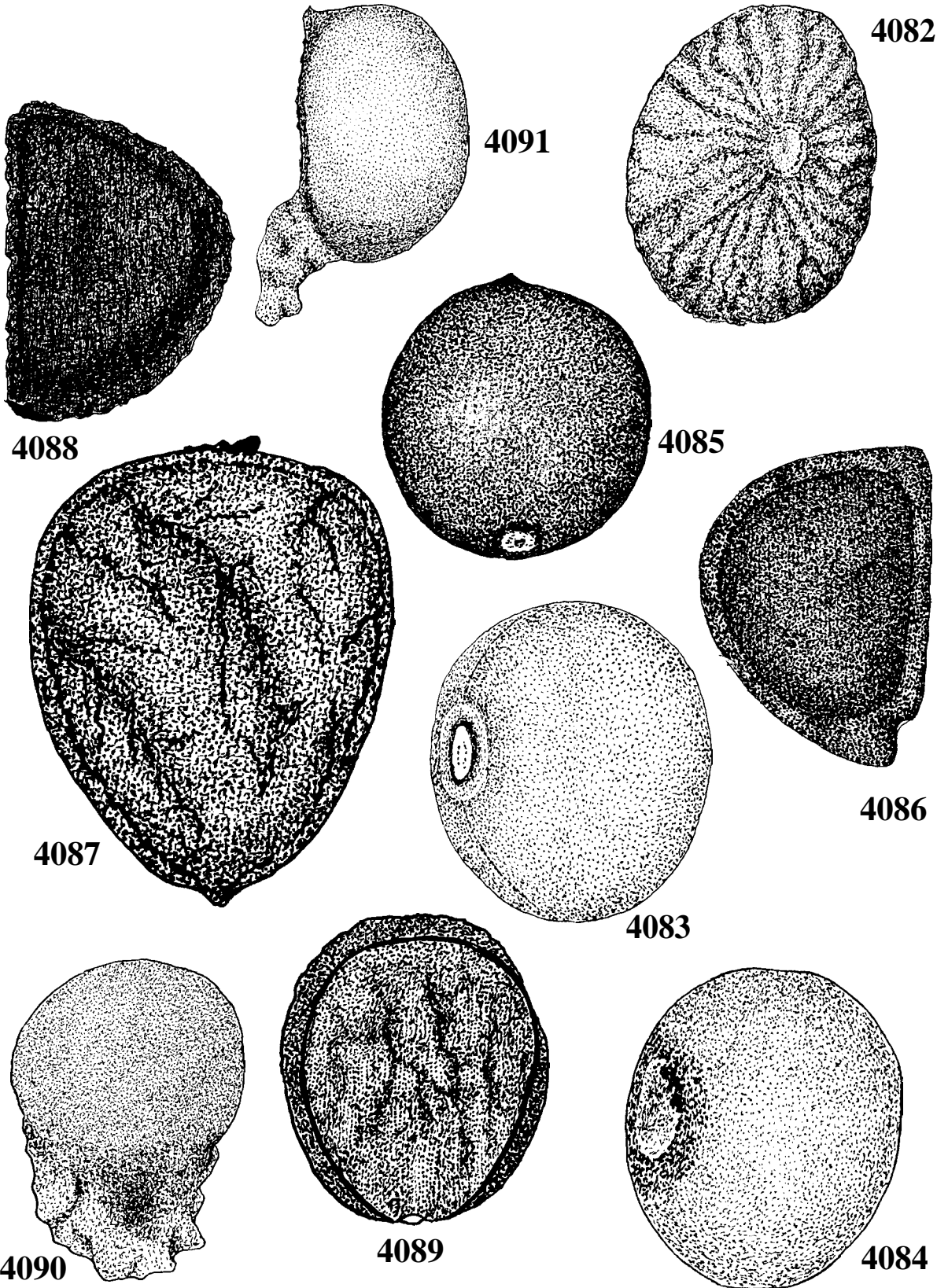
**4089. *Yucca gloriosa* L.** — Perennial, stems 50-200 cm high, usually branched in older plants, leaves very rigid and with strong, pungent apex, with reddish-brown margins. **Seeds spherical or obovate, lateral compressed, 5-7 x 4-6 x c. 2 mm. Surface wrinkly, very fine reticulate, slight lustrous, black.** Native to the southeastern part of the USA; in the Carpathians very rarely cultivated as a decorative plant in flowerpots or in greenhouses.

## 167. AMARYLLIDACEAE

**4090. *Galanthus elwesii* Hook. fil., *G. graecus* Orph.** — Perennial, peduncle 30-40 cm high, flower solitary. **Seeds spherical or elliptic with or without flat area on lateral side or apex, arilate, 4-5 x 3-3.6 mm. Surface fine foveolate, lustreless, yellowish or brown. 2n = 24, 48.** Native to the Balkan Peninsula, in woods of *Quercus pubescens* and *Carpinus orientalis*. Mo, Ro, Uk.

**4091. *Galanthus nivalis* L.** — Perennial, peduncle erect, 10-30 cm high, with one droopy aromatic flower. **Seeds elliptic, with hyaline suture on ventral side and aril at bottom, 3-3.5 x 2.2-2.4 mm. Surface glabrous, yellowish to orange, lustreless.**





**2n = 24.** Native to Europe, lowland and moist woods and shrubberies, secondary in parks and meadows of all Carpathian territories.

**4092. *Galanthus plicatus* M. Bieb.** — Perennial, peduncle 20-40 cm high, glaucous, flowers white. **Seeds elliptic, with hyaline raphe on ventral side and aril at bottom, 3.5-4.5 x 2.8-3.2 mm. Surface fine foveolate, lustreless.** **2n = 24.** Native to south-eastern Europe, shady and leafy woods. Mo, Ro, Uk.

**4093. *Leucojum aestivum* L.** — Perennial, peduncle 30-60 cm high, hollow, compressed, narrowly double-winged, paumbel with 2-7 flowers. **Seeds obovate or globular, apex roundish, bottom gradually narrowed with indistinct hilum, 6-8 x 4.5-5.5 mm. Surface fine granulate, lustrous, black.** **2n = 22, 24.** Native to Europe, moist to swampy meadows, coastal scrubs, boundaries and lowland woods. Hu, Mo, Ro, Sk, Uk.

**4094. *Leucojum vernum* L., *Eriosna carpaticum* Spring** — Perennial, stem with 1 or 2 flowers, 3-4 leaves growing out of one onion. **Seeds obovate, with rib or raphe on ventral side and aril at bottom, 4.4-5 x 2.4-2.8 mm. Surface fine granulate, dull, dark-brown.** **2n = 22 (20-24).** Native to Europe, moist, shady, humous woods, lowland and screes forest, wet meadows. Hu, Mo, Pl, Ro, Sk, Uk.

**4095. *Narcissus angustifolius* Curt., *N. radiiflorus* Salisb., *N. stellaris* (Haw.) Zahriade** — Perennial, stem compressed, slender, 20-60 cm high, membranous. **Seeds obovate or elliptic, rounded in transversal section, with small beak on apex, 2.9-3.3 x 2-2.3 mm. Surface smooth or ruminate, faint or slight lustrous, black.** **2n = 14.** Native to southcentral Europe, pastures, hayfields, felled areas, orchards, of montane and subalpine zones. Ro, Uk.

**4096. *Narcissus bulbocodium* L.** — Perennial, peduncle 10-30 cm long, flowers solitary, corolla 12-15 mm long, conic, undulated. **Seeds moonlike or triangular, 2-2.6 x 1.4-1.6 mm. Surface slight wrinkly, lustrous, black.** Native to southwestern Europe and northern Africa; in the Carpathians cultivated as a permanent ornamental in numerous cvs.

**4097. *Narcissus jonquilla* L.** — Perennial, peduncle tender, 20-30 cm high, inflorescence of 2-6 flowers. **Seeds ± spherical, moonlike or triangular, 2-2.5 x 1.7-2 mm. Surface scabrous, lustrous, black.**

Native to Eurasia; cultivated as a decorative plant in numerous cvs throughout the Carpathians.

**4098. *Narcissus odorus* L.** — Perennial, bulb 25-40 mm in diam., 3-4 leaves growing out of one bulb, stem 30-40 mm high, with 1-4 flowers. **Seeds elliptic, dorsal side roundish, ventral with longitudinal raphe, lateral side sometimes with flat area, 2.8-3.2 x 2.1-2.4 mm. Surface glabrous or slight wrinkly, lustrous, black.** Native to southwestern Europe; in the Carpathians cultivated in gardens and parks in numerous cvs and forms of hybrid origin (*N. jonquilla* x *pseudonarcissus*).

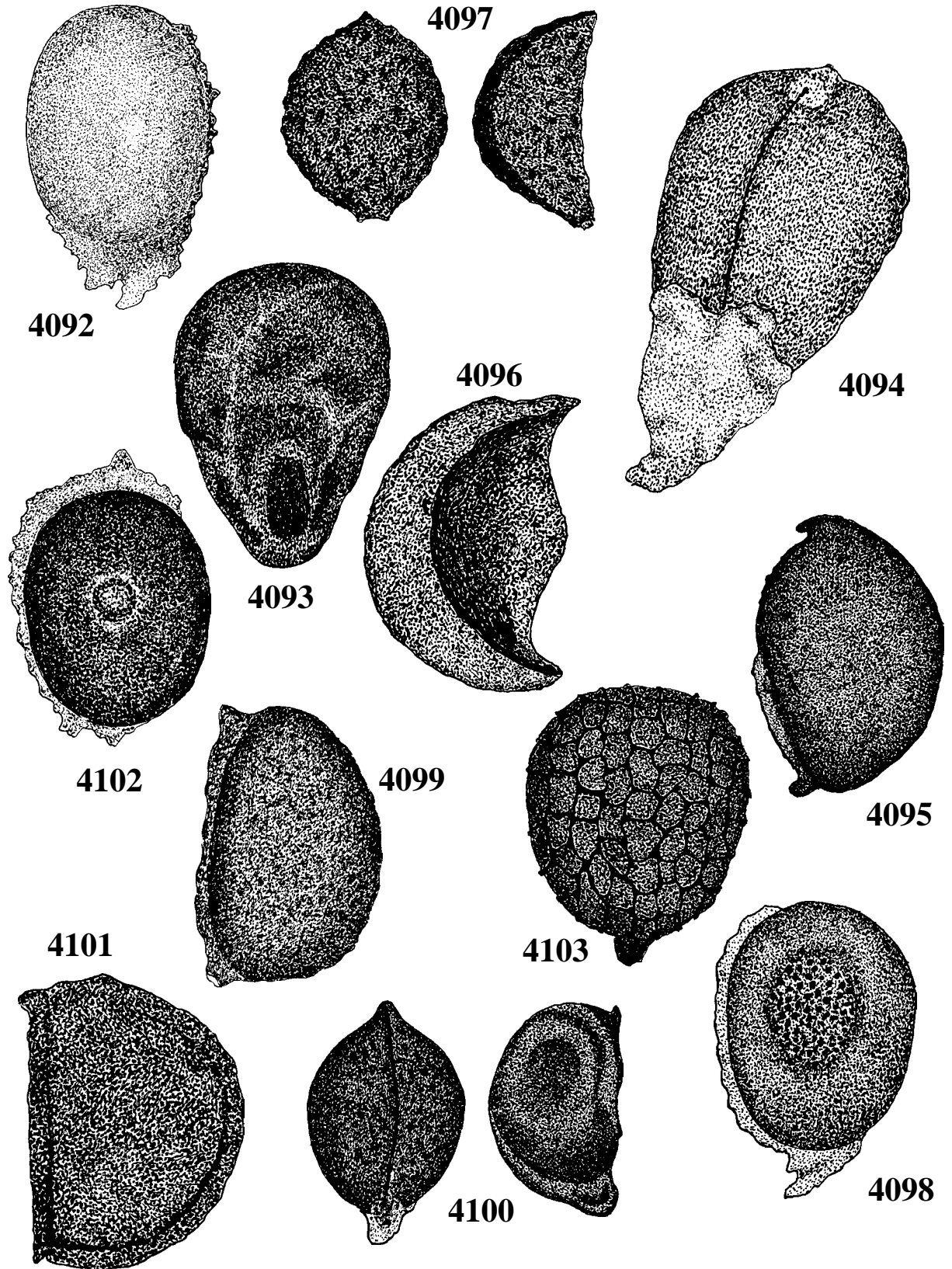
**4099. *Narcissus poeticus* L.** — Perennial, peduncle compressed, 20-50 cm high, flowers solitary, droopy. **Seeds ovoid, with raphe on ventral side, 2.9-3.2 x 1.8-2 mm. Surface scabrous, lustrous, black.** **2n = 14, 16, 21.** Native to southern Europe, currently cultivated as a permanent ornamental in gardens, in many cvs; throughout the Carpathians, uniquely escaping onto compost and rubbish heaps.

**4100. *Narcissus pseudonarcissus* L.** — Perennial, peduncle 20-50 cm long, erect, flowers solitary, rarely 2-4, droopy, 4-6 leaves from one onion. **Seeds spherical or elliptic, with or without aril and longitudinal rib or suture, 3-3.5 x 2.2-2.7 mm. Surface smooth, ± scabrous, lustrous, black.** **2n = 14, 21, 28.** Native to southwestern Europe; in the Carpathians commonly cultivated as a permanent ornamental in gardens.

**4101. *Narcissus tazetta* L.** — Perennial, peduncle 20-45 cm long, erect, flowers aromatic, 2-15 in paumbels, yellow to orange. **Seeds semispherical or triangular, lateral flattish, dorsal side roundish, ventral straight, 2.8-3.2 x 2.2-2.4 mm. Surface wrinkly, lustrous, black.** **2n = 20-32.** Native to the Mediterranean; in the Carpathians cultivated as a permanent ornamental plant in gardens, mostly in subspp. *lacticolor* (Haw.) Bak., uniquely escaping.

**4102. *Sternbergia colchiciflora* Waldst. et Kit.** — Perennial, stem very short (1-2 cm), leaves (2-4) growing out of one ovoidal onion. **Seeds elliptic with yellowish raphe on ventral side and ringlet on lateral side, 2.5-3 x 1.8-2.2 mm. Surface longitudinal faint striate, lustreless, dark-brown.** **2n = 20.** Native to Eurasia, stony overgrown calcite slopes and rocky steppes. Hu, Mo, Ro, Sk, Uk.

**4103. *Sternbergia lutea* (L.) Ker.-Gawler, *Oporanthus luteus* (L.) Herbert** — Perennial, scapes 4-10 cm



high, leaves up to 15 mm wide, subentire to minutely crenulate. Seeds  $\pm$  spherical or obovate, upper part  $\pm$  truncate, lower slight narrowed, 2.2-2.4 x 1.9-2.1 mm. Surface reticulate, lustrous, dark-brown.  $2n = 22$ . Native to the Mediterranean region, stony slopes and dry scrubs. Ro (?).

**4104. *Hippeastrum hortorum*** Maatsch – Perennial, flowering stems 10-15 cm high, with large brown onions, fleshy roots and swordy leaves. Seeds obovate, apex  $\pm$  truncate, bottom gradually narrowed, 1.7-2.3 x 1.3-1.7 mm. Surface undulate (margin part) and humpy (central part), lustrous, dark-brown. Native to South America; in gardening are cultivated mainly the hybrids or cvs of *H. vittatum* Herb., *H. leopoldii* Domb., *H. procerum* Ch. Lem., etc.

**4105. *Clivia miniata*** (Lindl.) Regel, *Vallota miniata* Lindl. – Perennial, robust, up to 50-60 cm high, stems compressed, with 10-20 basal persistent leaves. Seeds spherical, with rounded depressions at apex and bottom, 10-20 x 7-15 mm. Surface smooth in fresh state, after drying up with irregular ribs, dull, reddish-brown. Originally in Natal (southern Africa); in the Carpathians cultivated as an apartment plant in many varieties or cvs.

**4106. *Clivia nobilis*** Lindl., *Himantophyllum aitonii* Hook. – Perennial, robust plant, flowers on compressed stock, 30-40 cm high, one stock with 40-50 flowers. Seeds  $\pm$  ellipsoid or spherical, concavo-convex, apex with cap, bottom with foot (aril), 10-15 x 8-12 mm. Middle part surface covered with tangled hairs, bottom and apex smooth or furrowed, lustreless, greyish-brown. Native to south Africa; often cultivated as a room plant, in many cvs.

**4107. *Amaryllis belladonna*** L. – Perennial, bulb c. 10 cm in diam., with one stolon and 6-9 leaves, inflorescence with 5-12 flowers. Seeds spherical, oval or obovoidal, lateral strong compressed, with broad wing around, 16-20 x 10-15 mm. Surface longitudinal faint striate, slight lustrous, dark-brown. Native to Mexico and South America (Antilles), cultivated as a permanent ornamental in apartments or greenhouses.

**4108. *Amaryllis vittata*** Ait., *Hippeastrum vittatum* (Ait.) Herbert – Perennial, bulb globose, c. 7 cm in diam., 6-8 leaves, one stem 60-100 cm high, 2-6 flowers. Seeds obovoid, lateral strong flattish, with

broad wing around, 16-22 x 10-15 mm. Surface longitudinal faint striate, lustrous, brownish-black. Originally growing in South America (Peru, the Andes), grown as an ornamental plant in apartments and greenhouses in numerous cvs and hybrids.

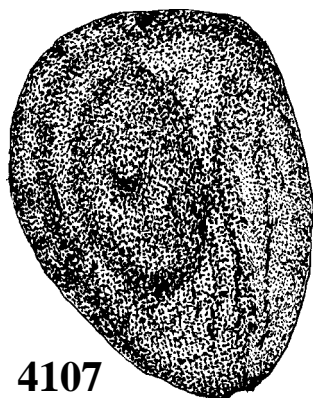
**4109. *Zephyranthes candida*** (Lindl.) W. Herbe, *Amaryllis candida* Lindl. – Perennial, bulb ovoidal, 20-30 mm in diam., 4-6 leaves, 20-35 cm long, peduncle with solitary flower. Seed triangular, dorsal side narrower or broader roundish, ventral rooflike straight, winged at edges, 6-7 x 3.5-4 mm. Surface longitudinal faint, granular striate, lustrous, black. Originally introduced from South America. Commonly cultivated as a permanent ornamental in apartments.

**4110. *Zephyranthes grandiflora*** Lindl., *Z. rosea* Hort. – Perennial, ovoidal bulb 20-25 mm in diam., leaves 4-6, c. 20-30 cm long, peduncle with solitary flower. Seeds obconic, lateral strong compressed, dorsal side roundish, ventral  $\pm$  straight, apex truncate, 9-13 x 6.5-7.5 mm. Surface longitudinal faint striate, lustrous, blackish-brown. Originally growing in Central America; frequently cultivated as an ornamental in apartments in flowerpots.

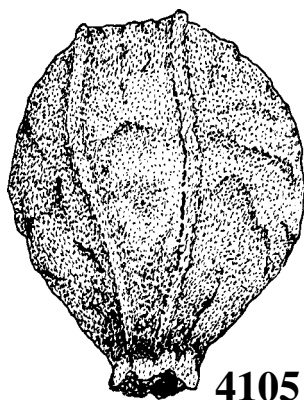
**4111. *Alstroemeria aurantiaca*** D. Don, *A. aurea* Meyen. – Perennial, up to 50-70 cm high, with strong stem, leaves oblong-lanceolate, inflorescence with 10-20 flowers. Seeds roundish, with distinct apex and hilum, 2-2.6 mm in diam. Surface tuberculate, dull, reddish brown. Native to Chile, a very nice permanent ornamental plant cultivated in flowerpots and gardens; in warmer regions of the Carpathians.

**4112. *Alstroemeria pulchella*** L. fil., *A. banksiana* Roem., *A. psittacina* Lehm. – Perennial, strong stems 40-60 cm high, durable flowers campanulate, orange or reddish. Seeds  $\pm$  spherical, often with flat area and longitudinal furrow leading from apex to hilum, 2.7-3.3 x 2.7-3.3 mm. Surface waved, lustreless, yellowish-brown. Native to northern Brazil; in the Carpathians cultivated in gardens for its nice flowers and also for bouquets.

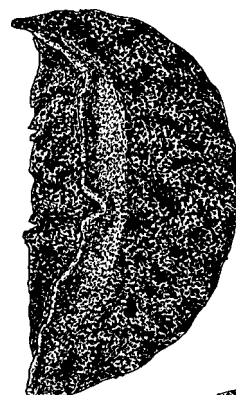
**4113. *Haemanthus albiflos*** Jacq. – Perennial, out of a green, compressed onion grow pulpy, 15-20 cm long leaves, flowering stem above the leaves short, with dense umbel of whitish flowers. Seeds ovoid or pyriform, lateral side with longitudinal furrow, apex with small beak, 9-10 x 7-8 mm. Surface smooth, lustrous, whitish. Native



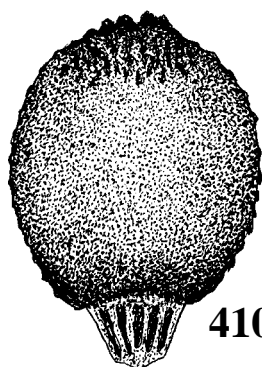
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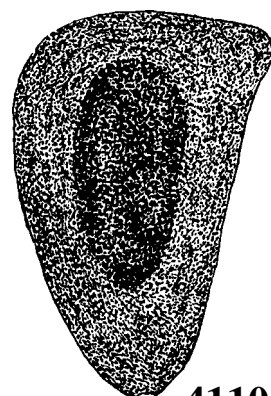
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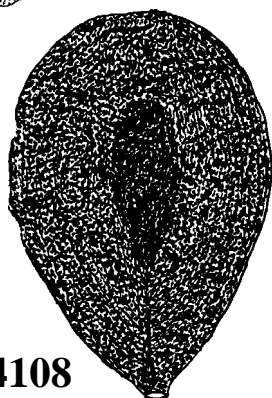
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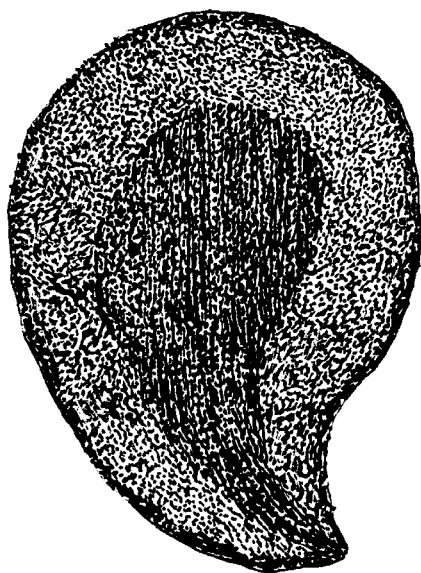
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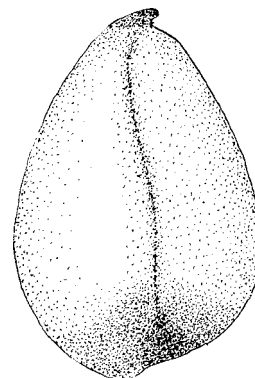
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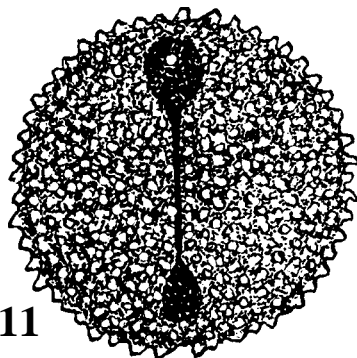
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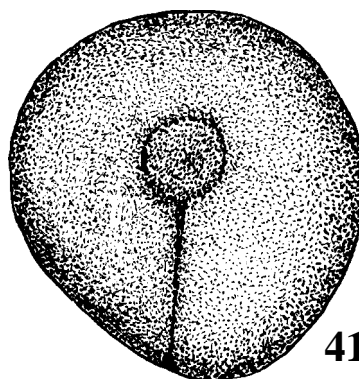
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4112

to southern Africa; in the Carpathians rarely cultivated as an ornamental in apartments, in flowerpots.

### 168. DIOSCOREACEAE

**4114. *Tamus communis*** L. — Perennial, dioecious, cylindric, its shoots are 2-4 m high and have cordate leaves. **Seeds spherical, ventral side with longitudinal rib, apex with pale style stain 3.2-3.6 x 3-3.4 mm. Surface smooth or faint undulate, lustreless, pale- or dark-brown.** Native to Eurasia, shady woods, shrubberies, vineyards and forest margins. Hu, Ro, Sk, Uk.

### 169. IRIDACEAE

**4115. *Crocus albiflorus*** Kit. et Schult., *C. vernus* subsp. *albiflorus* (Kit. et Schult.) K. Richt. — Perennial, leaves 2-4, linear, rarely 2 from one bulb, flowers single, white. **Seeds spherical, ventral side with longitudinal rib, apex with small excrescence, bottom with aril, 2.7-3.2 x 2-2.4 mm. Surface on one site flat, reddish-brown, faint downy. 2n = 8.** Native to the Alps, secondary in forest meadows of central Europe. Hu, Sk, Uk.

**4116. *Crocus banaticus*** J. Grey, *C. iridiflorus* Heuff. — Perennial, leaves (1-3 from one bulb) linear, 5-7 mm wide, flowers single, violet or purple, dark-veinous, stalks 10-15 cm high. **Seeds ± spherical, ventral side with longitudinal rib, apex with small excrescence, bottom truncate with small aril, 3.1-3.5 x 2.4-2.6 mm. Surface velvety, dull, purple-violet. 2n = 26.** An East-Carpathian endemic growing in woods and shrubberies. Ro, Uk.

**4117. *Crocus chrysanthus*** Herb., *C. sulphureus* Griseb. — Perennial, plant 7-12 cm high, leaves glabrous, narrowly linear, 1-1.25 mm wide, univeinal, 1-3 yellow flowers emerging from one bulb. **Seeds elliptic or spherical with huge suture and aril, 3.3-4 x 1.8-2.2 mm. Surface waved, lustreless, yellowish-brown or purple. 2n = 12, 20.** Native to the Balkan Peninsula and Asia Minor, grassy areas, shrubberies, rarely cultivated as an ornamental in gardens. Mo, Ro.

**4118. *Crocus flavus*** Weston, *C. moesiacus* Ker.-Gawl., *C. aureus* Sibth. et Smith — Perennial, 4-8 leaves growing out of one bulb, flowers 1-4 pale-yellow to dark orange-yellow. **Seeds elliptic or spherical with huge raphe and aril, 3.8-4.2 x 2.2-2.4 mm. Surface ruminant, slight lustrous,**

**reddish-brown. 2n = 8.** Native to the Balkan Peninsula; in the Carpathians often cultivated as a permanent ornamental plant in gardens. Mo, Ro, Sk, Uk.

**4119. *Crocus heuffelianus*** Herb., *C. vernus* subsp. *heuffelianus* (Herb.) Beck — Perennial, leaves narrowly linearly lanceolate, flower violet or white with violet stripes. **Seeds elliptic or spherical, one or two areas flat, ventral side with raphe, apex with elaisome, 2.8-3.2 x 1.8-2.2 mm. Surface smooth, faint, downy, lustreless, reddish-brown. 2n = 14, 18.** Native to the Carpathians and Balkan mountains, meadows and grassy places, woods. Hu, Mo, Pl, Ro, Sk, Uk.

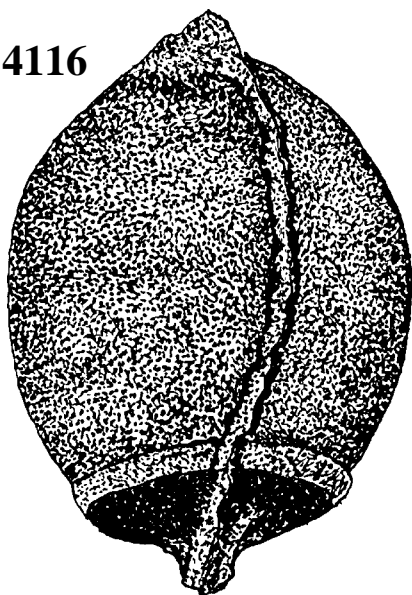
**4120. *Crocus neapolitanus*** Mord. et Loisel., *C. vernus* Hill. subsp. *neapolitanus* (Ker.-Gawl.) Hegi — Perennial, leaves narrowly linear, flowers large, white or violet. **Seeds spherical with one or two flat areas, ventral side with raphe, apex with small elaisome, bottom with caruncle, 2.5-3 x 2.1-2.5 mm. Surface smooth, faint downy, lustreless, reddish-brown. 2n = 8, 10, 12, 16, 18, 20, 22, 23, 24, 25, 28, 30, 32.** Native to southwestern Europe; in the Carpathians sometimes cultivated as a permanent ornamental plant in gardens, uniquely escaping.

**4121. *Crocus pallasii*** Goldb., *C. autumnalis* M. Bieb. — Perennial, plant 9-17 cm high, leaves linear, 1-1.5 mm wide, glabrous, flowers solitary, rare 2. **Seeds spherical, ventral side with huge raphe, 3.8-4.6 x 3-3.5 mm. Surface faint velvety, lustreless, purplish-brown. 2n = 14.** Native to southeastern Europe, grassy and rocky steppes. Ro, Uk.

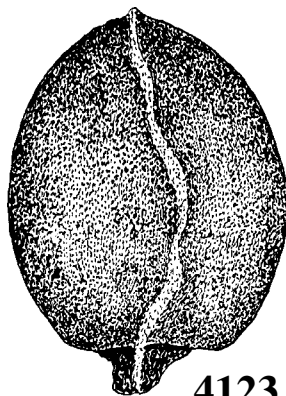
**4122. *Crocus reticulatus*** Steven, *C. variegatus* Hoppe et Hornsch. — Perennial, flowering plant 5-18 cm high, flowers mostly solitary. **Seeds ± spherical, with raphe on ventral side and aril on lower part, 2.8-3.3 x 2-2.3 mm. Surface velvety, dull, violet-carmine. 2n = 12.** Native to southeastern Europe, steppes, meadows and open woods. Hu, Mo, Ro, Uk.

**4123. *Crocus speciosus*** M. Bieb. — Perennial, plant 10-40 cm high, leaves 3.4-4.5 mm wide, flowers 1-2, lilac-blue, strongly veinous, often with darker external spots. **Seeds ovoid to spherical, planoconvex, with lateral raphe and caruncle at bottom, 2.8-3.2 x 2.2-2.5 mm. Surface short downy, lustreless, dark-purple. 2n = 18.** Native to the Crimea, woods and meadows; in the Carpathians rarely cultivated for ornament in gardens.

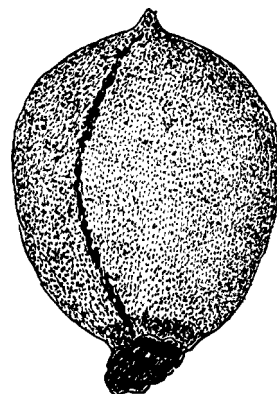
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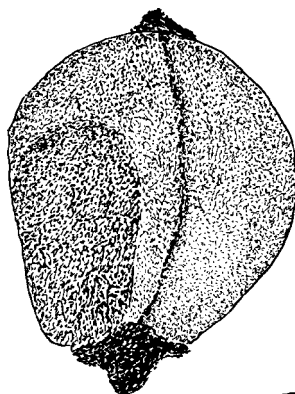
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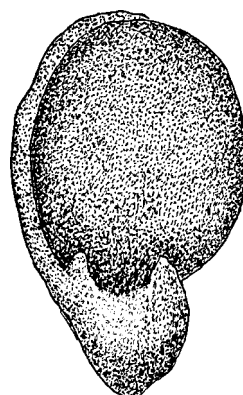
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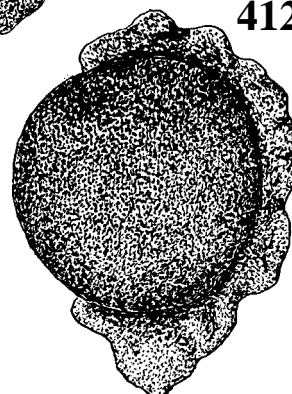
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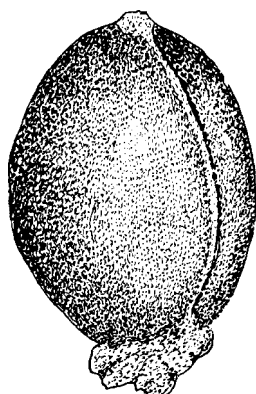
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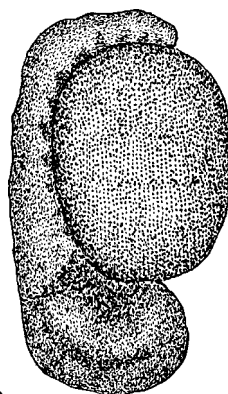
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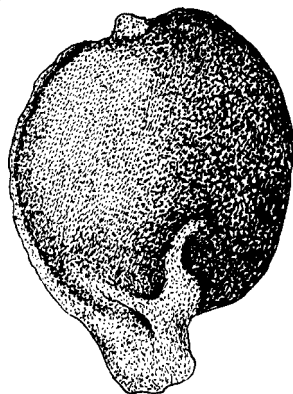
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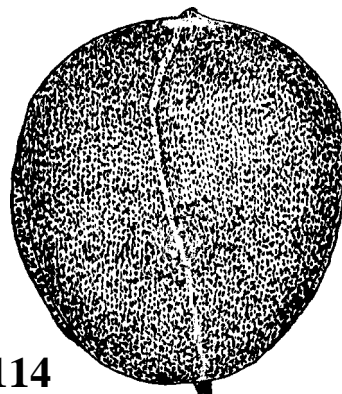
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**4124. *Crocus tommasinianus*** Herb., *C. thomasii* Ten. — Perennial, flower markedly violet to purple, leaves narrowly linear, 2-3 mm wide. **Seeds spherical, with one or two flat areas, ventral side with raphe, bottom with caruncle, 2.5-3 x 1.9-2.2 mm. Surface smooth, faint downy, lustreless, reddish-brown. 2n = 16.** Native to the Balkan Peninsula; in the Carpathians sometimes cultivated as a permanent ornamental plant in gardens.

**4125. *Crocus vernus*** (L.) Hill. — Perennial, plant 8-15 cm high, leaves 2.4-2.8 mm wide, linear, flowers 1 (2), white, purple or striped. **Seeds obovoid or spherical, dorsal side convex, small ventral side flat with caruncle, lateral side with distinct raphe, 2.7-3.2 x 2-2.4 mm. Surface often with depressed ring, smooth, whitish, short downy, lustreless, dark-purple. 2n = 8, 10, 13, 16, 18, 19, 20, 22, 23.** Native to southern Europe (eastwards of Italy), woods and mountain meadows. Hu, Mo, Ro, Uk.

**4126. *Sisyrinchium angustifolium*** Mill., *S. bermudiana* L. — Perennial, stems 15-45 cm high, ascending to suberect, narrowly winged, usually bearing 2 terminal inflorescences. **Seeds conic, apex narrowed, with pale rest of the style, bottom wide, with indistinct hilum, 1.3-1.5 x 1.2-1.4 mm. Surface foveate, slight lustrous, black. 2n = 64, 88.** Native to the eastern part of North America, grasslands and lake-shores; in the Carpathians often cultivated for ornament in gardens.

**4127. *Sisyrinchium montanum*** E. L. Greene — Perennial, stems 15-40 cm high, stiffly erect, usually bearing only 1 inflorescence, flowers violet-blue. **Seeds conic, apex gradually narrowed, with pale rest of the style, 1.6-1.8 x 1.3-1.5 mm. Surface reticulate-foveate, lustrous, black. 2n = 96.** Native to the eastern part of North America, dry grasslands and disturbed grounds; in the Carpathians grown as an ornamental, widely naturalized. Pl, Sk, Uk.

**4128. *Crocsmia crocosmiiflora*** (Lemoine) N. E. Br., *Montbretia crocosmiiflora* Lemoine — Perennial, stems erect, thin, 30-90 cm high, mostly simple, flowers yellowish-red. **Seeds globose or irregular shaped, often with white raphe, 2.7-3 x 2-2.2 mm. Surface wrinkly, lustrous, dark-purple. 2n = 22, 33, 44.** Cultivated hybrid - *C. aurea* Pappe x *pottsii* (Baker) Baker, originated in southern Africa; in Europe often cultivated for ornament in gardens.

**4129. *Gladiolus communis*** L. — Perennial, 50-80 cm high, basal sheaths green or red-veinous, spike 10 to 20-flowered, often with 2-3 axillary branches. Flowers pink, red or purplish-red. **Seeds obovoid, lateral much compressed, apex ± truncate, bottom gradually narrowed, 6-7 x 3.8-4.2 mm. Surface reticulate, slight lustrous, centre dark reddish-brown, margin pale reddish-brown. 2n = 120.** Native to southern Europe; in the Carpathians cultivated as a highly ornamental plant in many cvs and hybrids.

**4130. *Gladiolus illyricus*** Koch — Perennial, 25-50 cm high, basal sheaths green, sometimes tinged red, spike 3 to 10-flowered. **Seeds rhombohedral or elliptic, lateral compressed, proper seed in the centre of membranous cover, 4.5-5.5 x 2.8-3.2 mm. Surface reticulate, lustrous, oval seeds red, membrane reddish-yellow. 2n = 60, 90.** Native to southwestern Europe, heaths, scrubs and open woodlands. Ro.

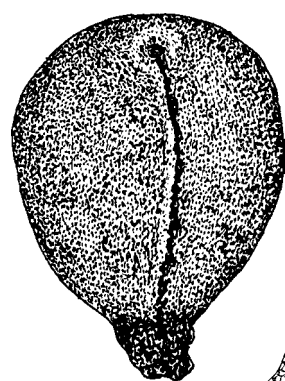
**4131. *Gladiolus imbricatus*** L. — Perennial, plant 30-80 cm high, erect, poorly ramified above. **Seeds lateral compressed, obconic or prolonged obovate, broad winged, 4.8-5.8 x 2.8-3.2 mm. Surface reticulate, slight lustrous, purplish-brown. 2n = 60.** Native to Europe, wet meadows, woods and fields of the montane zone. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4132. *Gladiolus italicus*** Mill., *G. segetum* Ker.-Gawl. — Perennial, stems 25-50 cm high, basal sheaths pale to dark-red, often spotted white or pale-green, inflorescence with 6-16 flowers. **Seeds globose-pyriform, 4-4.8 x 2.7-3.2 mm. Surface ruminate, lustrous, dark-purple. 2n = 120, 171 ± 2.** Native to southern Europe, tilled lands, stony slopes, meadows. Uk.

**4133. *Gladiolus palustris*** Gaudin — Perennial, plant 30-50 cm high, bulb 2 cm in diam., leaves sword-shaped, usually only two, inflorescence one-sided. **Seeds prolonged obovate, laterally flattish, winged around, 4.8-5.6 x 2.5-3 mm. Surface reticulate, lustrous, reddish-brown, wing pale. 2n = 60.** Native to Europe, fen meadows, light lowland forests and shrubberies in moist to wet places. Br, Hu, Pl, Ro, Sk, Uk.

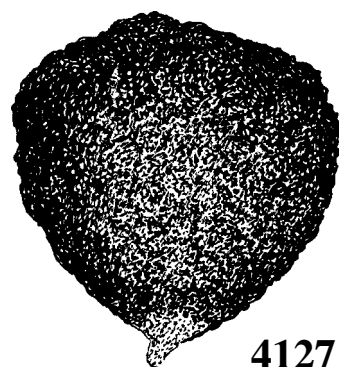
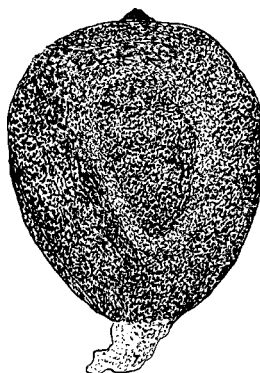
**4134. *Iris aphylla*** L., *I. nudicaulis* Lam., *I. hungarica* Waldst. et Kit. — Perennial, stems 15-20 cm, from base poorly ramified, leaves sword-shaped, flowers whitish-violet. **Seeds obovate, round in transversal section, 4.5-5.2 x 2.9-3.3 mm. Surface irregular, rough reticulate, lustreless, reddish-brown. 2n =**





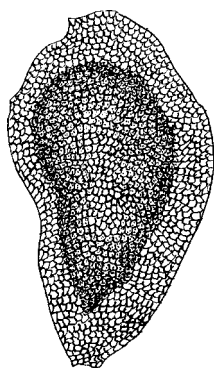
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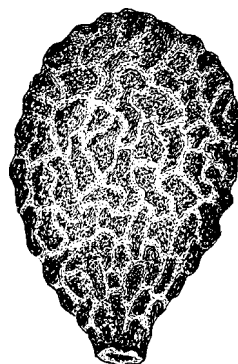


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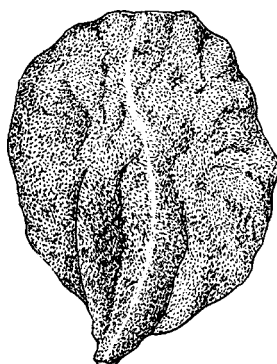
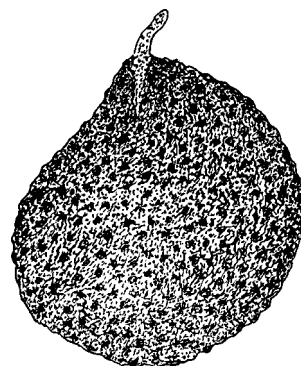
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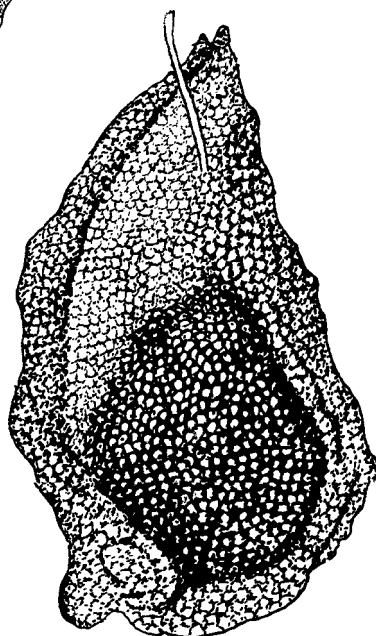
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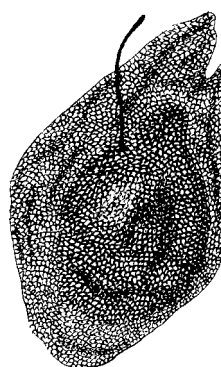
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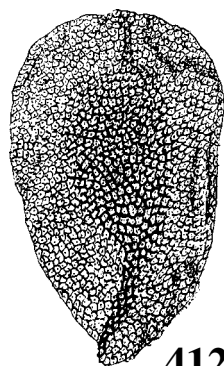
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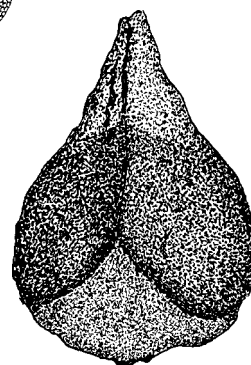


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4129

4132



**24, 40, 48.** Native to central Europe, sunny, grassy slopes, shrubberies, karst steppes and rocks; growing throughout the Carpathians in subsp. *hungarica* (Waldst. et Kit.) Hegi.

**4135. *Iris arenaria*** Waldst. et Kit., *I. pineticola* Klokov, *Iris humilis* Georgii subsp. *arenaria* (Waldst. et Kit.) Á et D. Löve – Stems erect, 5-15 cm high, bulbous, roughened below, rooting down with leafy rosette, flowers yellow. **Seeds ovate or spherical, with large hilum, 3-3.5 x 2.1-2.4 mm. Surface rugose, slight lustrous, reddish-brown. 2n = 22.** Native to central Europe, sunny and dry, stony slopes and uphill. Hu, Ro, Sk, Uk.

**4136. *Iris florentina*** L. – Perennial, stems up to 60-70 cm high, ramified, flowers aromatic, pale reddish-violet. **Seeds obovate or spherical, roundish in transversal section, 5.5-6.3 x 4.8-5.2 mm. Surface irregular, rough wrinkly, lustrous, purplish-brown. 2n = 24, 28, 48.** Originally growing in southern Europe (probably selected-off in Italy), today often cultivated as a permanent ornamental in gardens, its rhizomes are used in medicine. Mo, Ro, Uk.

**4137. *Iris germanica*** L. – Perennial, stems erect, 30-100 cm high, leafy, ramified above, multiflorous, flowers yellowish-white, darkly veinous. **Seeds obovate or elliptic, roundish in transversal section, apex with small growth, bottom gradually prolonged up to hilum, 5.5-6.5 x 3.7-4.3 mm. Surface irregular rough, reticulate or wrinkly, slight lustrous, dark purplish-brown. 2n = 36, 44, 48.** Native to the Mediterranean, sunny and rocky slopes, vineyards, calcareous, stony and loamy grounds, since a long time cultivated as an ornamental in gardens and parks.

**4138. *Iris graminea*** L., *Iris pseudocyperus* Schur – Perennial, tufted, stems erect, 10-30 cm high, narrowly 2-winged, flowers whitish. **Seeds ± obovate, dorsal side roundish, ventral with longitudinal raphe, 5-5.6 x 3.8-4.2 mm. Surface rough wrinkly, lustrous, yellowish-brown. 2n = 34.** Native to Europe, shrubby and grassy slopes, pastures, meadows, moist, in summer drying out grounds; throughout the Carpathians.

**4139. *Iris halophila*** Pall., *I. spuria* subsp. *halophila* (Pall.) D. A. Webb. et Chater – Perennial, stem 40-90 cm high, basal leaves 7-12 mm wide, upper cauline leaves longer than internodes. **Seeds halfmoon-shaped, reniform or oval, lateral**

**compressed, 5-6 x 4-4.8 mm. Surface of central part foveal, marginal smooth, lustrous, yellowish-brown. 2n = 20.** Native to southeastern Europe, saline stands and lowland wet forests. Mo, Ro, Uk.

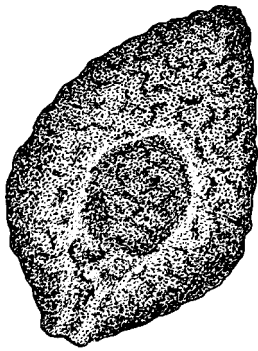
**4140. *Iris illyrica*** Tommasini, *I. germanica* subsp. *illyrica* (Tommasini) Nyman – The species have been described as intermediate in character between the two subspecies of *I. pallida* Lam. (subsp. *pallida* and subsp. *cengialti* Ambrosi). **Seeds obovate, bottom gradually narrowed, apex semirounded, 4-4.8 x 2.8-3.2 mm. Surface preavillingly transversal deep wrinkly, dark-brown.** Native in northwestern Yugoslavia; in the Carpathians rarely cultivated as ornamental in gardens.

**4141. *Iris pallida*** Lam. – Perennial, stems up to 120 cm high, leaves 20-60 x 1-4 cm, flowers 2-4, violet or whitish-violet. **Seeds semispherical, lateral compressed, 5.5-6.5 x 4.5-5 x 2-3 mm. Surface irregular, rough-reticulated or wrinkly, slight lustrous, reddish-brown. 2n = 24.** Native to southern Europe; in the Carpathians often cultivated as a permanent, ornamental plant in gardens. Hu, Ro, Uk.

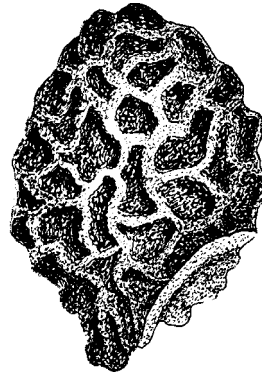
**4142. *Iris pseudacorus*** L., incl. *I. monnieri* auct. non DC. – Perennial, stems 60-120 cm high, slightly compressed, bearing several leaves, basal leaves 50-90 cm x 10-30 mm. **Seeds globose, lateral compressed, apex with small peak, bottom rougher than the apex, 7.5-8.5 x 7.5-8.5 mm. Surface smooth, faint lustrous, dark-brown. 2n = (24, 30, 32) 34 (40).** Native to Euro-Siberia, wet places near rivers, dead arms, water ditches, boundaries, reed swamps in all Carpathian regions.

**4143. *Iris pumila*** L., *Iris tristis* Schur – Perennial, stems only 1 cm high, uniflorous, ground leaves erect, flowers violet, rarely rosy. **Seeds ovoid or spherical with one or two darker areas on lateral sides, 4.5-5.5 x 2.7-3.3 mm. Surface rough, irregular reticulate, lustrous, purplish-brown. 2n = 30, 32 (36).** Native to Europe, sunny, stony and shrubby hills and slopes, sandy uplands. Au, Hu, Mo, Ro, Sk, Uk.

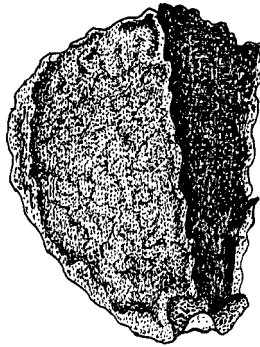
**4144. *Iris reichenbachii*** Heuffel, incl. *I. balcana* Janka, *I. bosniaca* G. Beck – Perennial, stems 4-30 cm high, slender, leaves 8-35 cm x 3-15 mm, flowers 1-2, violet to brownish purple. **Seeds mostly halfmoon-shaped, pyriform, 5.5-6.5 x 3.7-4.3 mm. Surface rugose, lustrous, brown. 2n = 24, 48.** Native



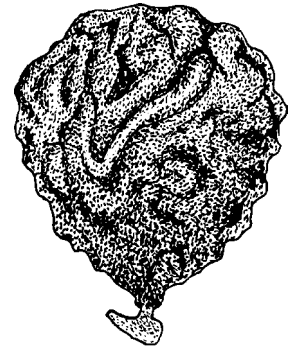
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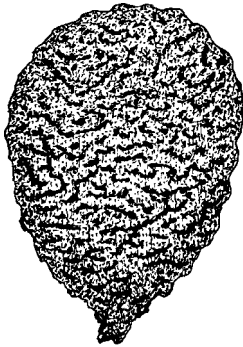
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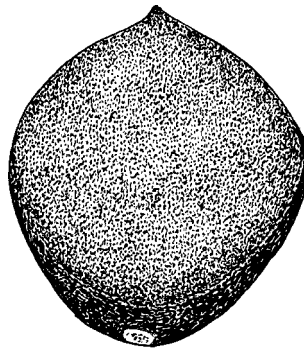
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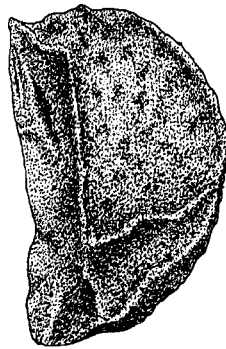
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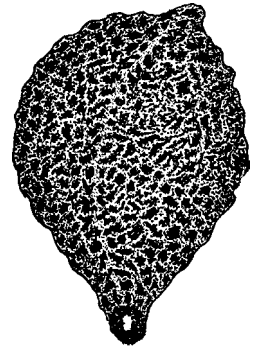
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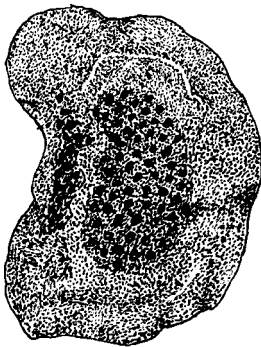
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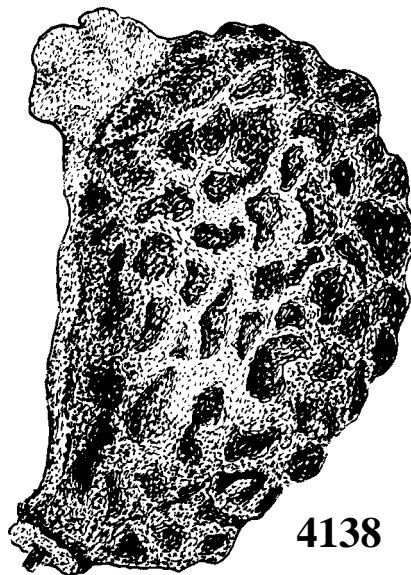
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4138

to southeastern Europe, rocky and grassy places, mainly in mountains, rare cultivated as ornamental in gardens. Ro.

**4145. *Iris ruthenica*** Ker.-Gawl., *I. caespitosa* Pall. — Perennial, stems 3-20 cm high, with c. 2 small leaves, basal leaves 10-30 cm x 4-6 mm, flowers solitary, violet. **Seeds globose, with a large, white aril on ventral part, 2.9-3.3 x 3.2-3.6 mm. Surface undulate, lustrous, dark-brown.** Native to temperate central and eastern Asia, meadows and open woodlands. Ro.

**4146. *Iris sambucina*** L. — Perennial, stems 40-60 cm high, leaves sword-shaped, flowers aromatic, reddish-violet. **Seeds semispherical, lateral compressed, with darker wrinkly area on both lateral sides, 5.5-6.3 x 4.6-5.2 mm. Surface of circumference smooth, central part foveate, high lustrous, orange-brown. 2n = 24.** Native to western Asia, or probably a selected-off taxon; nowadays often cultivated as a permanent ornamental in gardens and parks, uniquely escaping.

**4147. *Iris sibirica*** L. — Perennial, tufted, stems 50-120 cm high, erect, hollow, roundish or weakly compressed, only ramified above, uppermost leaves membranous. **Seeds semispherical, lateral flat-tish, dorsal side roundish, ventral ± straight, rooflike, often with broader wing, central part of lateral sides often darker and granular, 5-6 x 4.4-5 mm. Surface wrinkly, lustrous, dark-purple. 2n = 28.** Native to Euro-Siberia, moist meadows, lowland woods, moor forests and pastures on non-cultivated soils; in all Carpathian territories.

**4148. *Iris sintenisii*** Janka — Perennial, stems 25-30 cm high, cylindric or slightly compressed, basal leaves 20-50 cm x 1.5-5 mm, flowers violet-blue. **Seeds obovate, lateral compressed, 4.4-5 x 3.4-3.8 mm. Margin surface smooth, central part foveate, glossy, reddish-brown. 2n = 16, 18.** Native to southeastern Europe, dry grasslands and open scrubs. Ro.

**4149. *Iris spuria*** L., *Iris subbarbata* Joó — Perennial, stems erect, 30-80 cm high, roundish, poorly branched above, flowers violet, violetly veinous. **Seeds obovate, apex slight rounded, bottom gradually narrowed with hilum, 4.8-5.3 x 3.7-4.2 mm. Surface ± wrinkly, lustrous, centre of lateral sides dark-brown, margins pale-brown. 2n = 22.** Native to

Europe, wet and swampy meadows, saline, humous, wet and loamy soils. Hu, Ro, Sk.

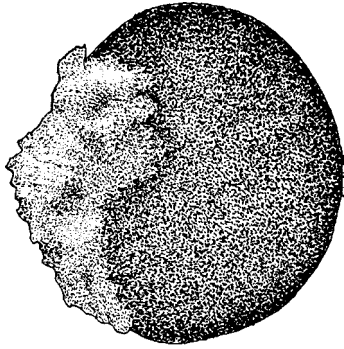
**4150. *Iris variegata*** L., *Iris lepida* Heuffel — Perennial, stem erect, 20-40 cm high, ramified above, leafy below, leaves broadly sword-shaped, flowers pale-yellow, brownish, veinous violet. **Seed ± pyriform with one or two darker areas on lateral sides, roundish in transversal section, 4.7-5.2 x 3.1-3.5 mm. Surface irregular rough reticulate or wrinkly, slight lustrous or dull, greyish-brown. 2n = 24.** Native to Europe, light woods, sunny shrubby and rocky slopes, steppe meadows and sandbanks. Hu, Mo, Ro, Sk, Uk.

**4151. *Iris versicolor*** L., *I. virginica* L., *I. pulchella* Regel — Perennial, stems up to 60 cm high, curved, with 2-3 flowering twigs, flower at base yellow, dark-violet later on. **Seeds ± semispherical, lateral flat-tish, dorsal side wide, roundish, ventral rooflike, 5-5.7 x 4.5-5.5 mm. Surface faint striate, slight lustrous, dark-brown. 2n = 72, 84, 100, 105, 108, 112.** Originally growing in North America; in the Carpathians often grown in moist soils of parks and gardens in variously coloured cvs.

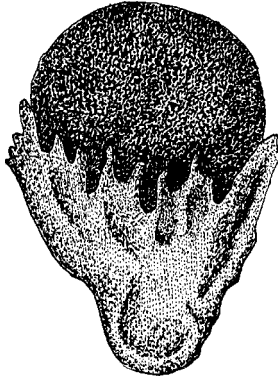
**4152. *Romulea bulbocodium*** (L.) Sebastiani et Mauri, *Trichonema bulbocodium* (L.) Ker.-Gawler — Perennial, scape 1 to 6-flowered, flowers variable in colour, basal leaves 2.5-3 cm x 0.8-2 mm, cauline leaves up to 5. **Seeds irregular globose, with flat hilum on one side, 2-2.4 x 1.7-2.1 mm. Surface fine waved, lustrous, dark-purple. 2n = 34, 36, 42.** Native to the Mediterranean region; in the Carpathians very rarely cultivated for ornament in gardens.

**4153. *Freesia refracta*** (Jacq.) Ecklon ex Klatt — Perennial, stems leafy, branched, up to 45 cm high, zig-zag, leaves 5-6, linear-lanceolate. **Seeds globose, with longitudinal aril on one side, 3-3.5 x 2.5-2.8 mm. Surface ruminant, glossy, dark-auburn.** Native to southern Africa; in the Carpathians cultivated for ornament and for bouquets in gardens.

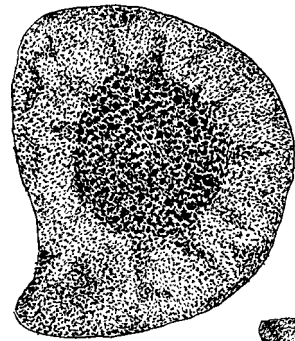
**4154. *Freesia hybrida*** hort. — Perennial, crooked stems 10-20 cm high, with 5-9 fragrant flowers, 4-7 lanceolate leaves, 5-12 cm long. **Seeds obovate, apex rounded, bottom with large dark-brown caruncle and suture on lateral side, 4.7-5.3 x 3.3-3.7 mm. Surface ruminant-granulate, lustrous, dark-brown.** Native to southern Africa; in the Carpathians favourite gardening plant, cultivated for cut-flowers in many cvs and hybrids.



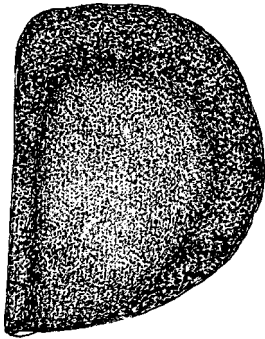
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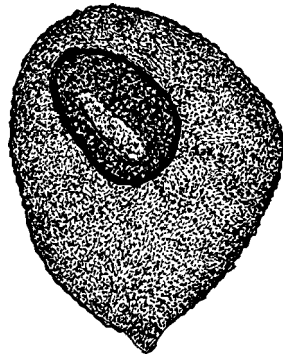
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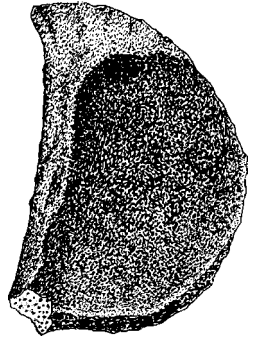
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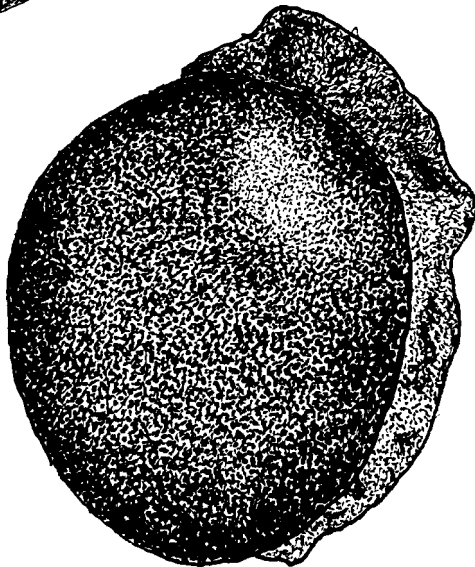
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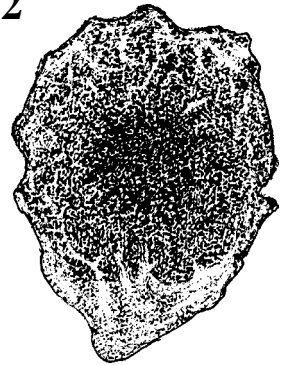
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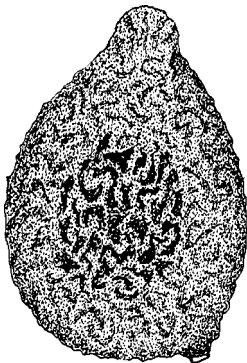
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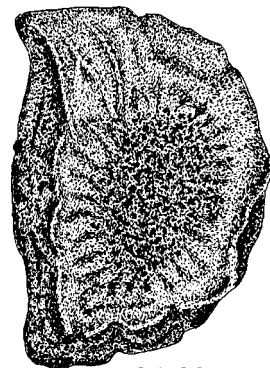
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**4155. *Tigridia pavonia*** (L. fil.) Ker.-Gawl. — Perennial, plant of the tropical region, flowers orange-red. **Seeds ellipsoid, with suture on one side, transversal section roundish, apex with small beak, 3-3.5 x 1.9-2.3 mm. Surface longitudinal fine striate, dull or faint lustrous, dark-auburn.** Native to Mexico; in the Carpathians very rarely grown for ornament.

## 170. CANNACEAE

**4156. *Canna indica*** L., *C. variabilis* Willd. — Perennial, stems 120-150 cm high, leaves c. 35 x 15 cm, elliptic, acuminate, inflorescence lax, flowers 3-5 cm in diam., hilumlet. **Seeds spherical or elliptic, roundish in transversal section, 8-9 x 6.6-7.5 mm. Surface glabrous, faint scrobiculate, high lustrous, black.** Native to tropical western India and America; often cultivated as a permanent ornamental in gardens and parks of warmer areas of the Carpathians.

## 171. COMMELINACEAE

**4157. *Commelina communis*** L. — Annual, light-green, bare, stems 20-70 cm long, procumbent, slightly striate, ramified, leaves pulpy, flowers bright-blue. **Seeds triangular, dorsal side slight rooflike, ventral flat with longitudinal furrow, 2.8-3.4 x 2.3-2.7 mm. Surface smooth or slight lumpy, with deep sockets, dull, greyish. 2n = 90.** Originally growing in eastern Asia; hauling into the Carpathians with cereals and another crops, waste grounds of warmer areas. Hu, Mo, Ro, Sk, Uk.

## 172. JUNCACEAE

**4158. *Tinantia erecta*** (Jacq.) Schlechtd., *T. undata* Humb. et Bonpl., *Tradescantia erecta* Jacq. — Perennial, stems rigid, erect, 20-30 cm high, glabrous, leaves lanceolate or ellipsoidal. **Seeds very irregular shaped, mostly prismoid with deep notches and depressions, 3-3.5 x 2-2.4 mm. Surface humpy, dull, dark-greyish.** Native to South America; in the Carpathians cultivated in gardens, rarely naturalized in free.

**4159. *Tradescantia virginiana*** L. — Perennial, stem 30-70 cm high, leaves linearly lanceolate, pulpy, flowers whitish or violet. **Seeds elliptic, dorsal side roundish, lace-shaped, ventral ± flat with longitudinal rib, 2.8-3.2 x 1.8-2 mm. Surface of both sides wrinkly, lustreless, grey. 2n = 24.** Originally growing in North America; in the Carpathians often cultivated as an ornamental plant in gardens.

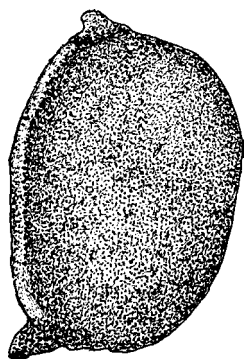
**4160. *Juncus acutiflorus*** Ehrh. ex Hoffm., *J. sylvaticus* auct. non Reichard — Perennial, densely tufted, stems rigid, erect, 30-110 cm high, smooth, roundish, with 2-3 basal sheaths and 2-4 leaves. **Seeds prolonged ± obovate, ventral side with suture, apex with caplet, bottom gradually narrowed, 0.45-0.55 x c. 0.2 mm. Surface longitudinal ribbed, slight lustrous, yellowish-brown. 2n = 40.** Native to Europe, moist to wet meadows, forest moors, fenlands, boundaries and springheads; in all Carpathian regions.

**4161. *Juncus acutus*** L. — Perennial, robust, stems 60-150 cm high, rigid, 2-4 mm in diam., upper part leafless. **Seeds elliptic, enclosed in transparent membrane, 1-1.5 x 0.4-0.5 mm (including membrane). Surface longitudinal ribbed, lustrous, reddish-brown.** Native to the Mediterranean as far as the Black Sea, sandbanks and saline soils. Ro (?).

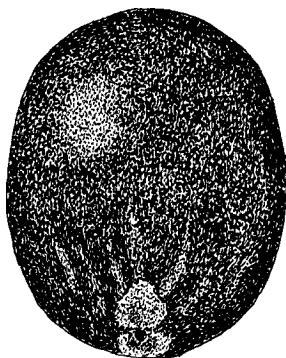
**4162. *Juncus alpinoarticulatus*** Chaix ex Vill. subsp. *geniculatus* Schrank, *J. erectus* Besser — Perennial, freely tufted, stems erect, 15-60 cm high, roundish, smooth, with 1 or 2 basal sheaths. **Seeds prolonged obovate, ventral side with longitudinal suture, apex with spermatyrium (caplet), bottom gradually narrowed with funiculus, 0.5-0.6 x 0.2-0.25 mm. Surface longitudinal ribbed, lustrous, dark-brown. 2n = 40.** Native to circumpolar territories, springheads, swamps and fenlands. Br, Hu, Pl, Ro, Sk, Uk.

**4163. *Juncus alpinus*** Vill., *J. carpaticus* Simk. — Perennial, stems 5-50 cm high, usually weak, with 0-2 basal sheaths and 2-5 cauline leaves. **Seeds ellipsoid or ovoid, sometimes oblique, biconvex, apex and bottom with beak, c. 0.6 x 0.3 mm. Surface longitudinal fine ribbed, lustrous, yellowish-brown, ribs dark-brown. 2n = 40.** Native to most of Europe, on swamps, springheads, moors and other damp places; in all mountains of the Carpathians.

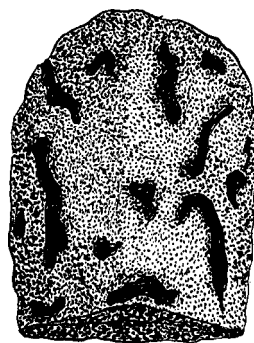
**4164. *Juncus articulatus*** L., *J. lampocarpus* Ehrh. ex Hoffm. — Perennial, tufted, deep-green, stems erect, 6-50 cm high, roundish, submerged stems crawling, up to 100 cm long. **Seeds elliptic, ventral side with faint raphe, apex with rest of style, bottom with funiculus, 0.45-0.55 x 0.25-0.35 mm. Surface reticulate, slightly lustrous, pale-brown. 2n = 80.** Native to circumpolar territories, moist meadows and swamps, stripped pond bottoms, boundaries, springheads and wet roads; in all Carpathian regions.



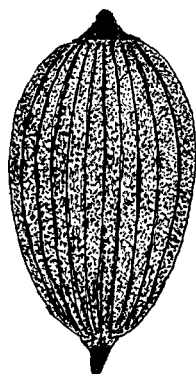
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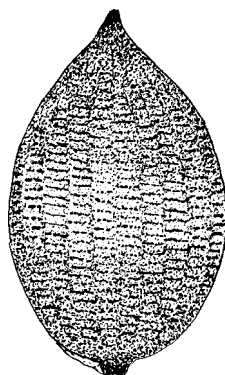
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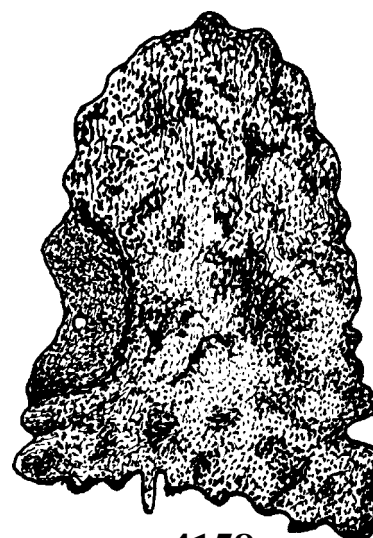
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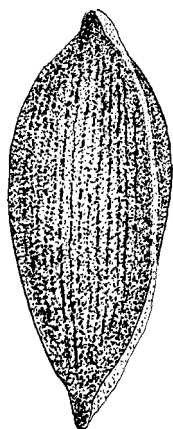
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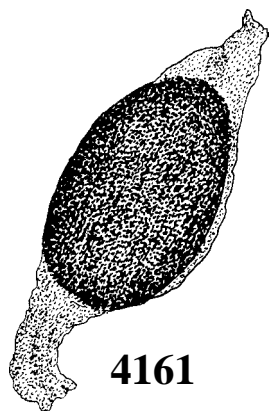
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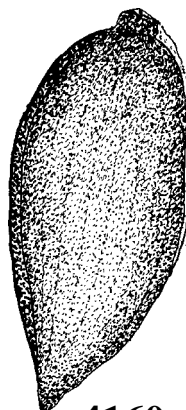
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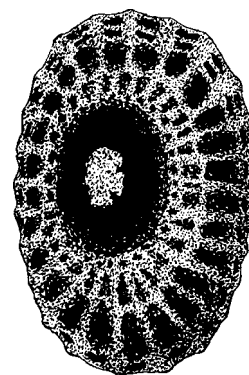
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**4165. *Juncus atratus*** Krock., *J. melananthos* Rchb., *J. serotinus* Schur — Perennial, tufted, greyish-green, stems  $\pm$  erect, 40-120 cm high with 3-5 leaves, without sheaths at base. **Seeds elliptic or spindle-shaped, apex with rest of style, bottom with funiculus, 0.5-0.7 x 0.2-0.3 mm. Surface longitudinal ribbed, lustrous, dark-brown. 2n = 40.** Native to Euro-Siberia, saline and wet meadows, margins of meadows swamps, boundaries, peatbogs; throughout the Carpathians.

**4166. *Juncus balticus*** Willd., *J. arcticus* subsp. *balticus* (Willd.) Hyl. — Perennial, stems erect, 10-100 cm high, rigid, non-flowering stems few or absent. **Seeds ovoid, with inconspicuous appendages at both ends, in whitish transparent cover, 0.7-0.9 x 0.4-0.5 mm. Surface irregular furrowed, slight lustrous, light-brown. 2n = 40.** Native to northern Europe, damp and sandy places, especially near coasts. Pl.

**4167. *Juncus bufonius*** L. — Annual, tufted, stems numerous, 5-50 cm high, erect or ascendent, with brown or yellowish bracteoles below. **Seeds shorter or longer elliptic, ventral side with raphe, apex with darker rest of style, 0.3-0.5 x 0.2-0.3 mm. Surface longitudinal ribbed, transversal runged, lustrous, pale-brown. 2n = 100-110 (? 120).** Native to circumpolar territories, muddy pastures, wet sandbanks, denuded riverbanks; in warmer areas of all Carpathian regions.

**4168. *Juncus bulbosus*** L., *J. supinus* Moench — Perennial, densely tufted, stem 1-30 cm high, filiform, floating in water, up to 1 m long, leaves filiform. **Seeds spindle-shaped or elliptic, apex truncate with rest of style, bottom with funiculus, 0.45-0.5 x 0.2-0.25 mm. Surface reticulate, slight lustrous or lustreless, brown. 2n = 40.** Native to circumpolar territories, swampy meadows, boundaries, pond margins. Br, Hu, Pl, Ro, Sk, Uk.

**4169. *Juncus capitatus*** Weigel, *J. gracilis* Roth — Annual, tufted, stem erect, 5-20 cm high, thin, weakly angular, with few leaves at base. **Seeds elliptic, apex with darker rest of style, bottom with funiculus, 0.3-0.4 x c. 0.2 mm. Surface longitudinal ribbed, transversal runged, lustrous, pale-brown. 2n = 18.** Native to Europe, moist, sandy pastures and overflowed riverbanks, wet fields. Br, Hu, Pl, Ro, Sk, Uk.

**4170. *Juncus castaneus*** Sm., *J. triceps* Rostk. — Perennial, non-tufted, stems erect, 10-32 cm high,

roundish, smooth, 2-3 mm in diam., with several sheaths at base. **Seeds elliptic enclosed in semitransparent membrane, 2.2-2.5 x 0.4-0.5 mm. Surface longitudinal ribbed, slight lustrous, seed brown, membrane whitish. 2n = 40, 60.** Native to Eurasia, near springheads of higher mountains. Pl, Ro, Sk, Uk.

**4171. *Juncus compressus*** Jacq., *J. parviflorus* Kit. — Perennial, scarcely tufted, greyish-green, stems erect, 10-40 cm high, flattish, smooth with 1-2 leaves. **Seeds obovate, ventral side with longitudinal hyaline raphe, apex acuminate, bottom hyaline, with hilum inside, 0.3-0.4 x 0.25-0.3 mm. Surface longitudinal ribbed and transversal runged, slight lustrous, reddish-brown. 2n = 44 (40).** Native to Eurasia, moist meadows, roads, pastures, riverbanks; in all Carpathian territories.

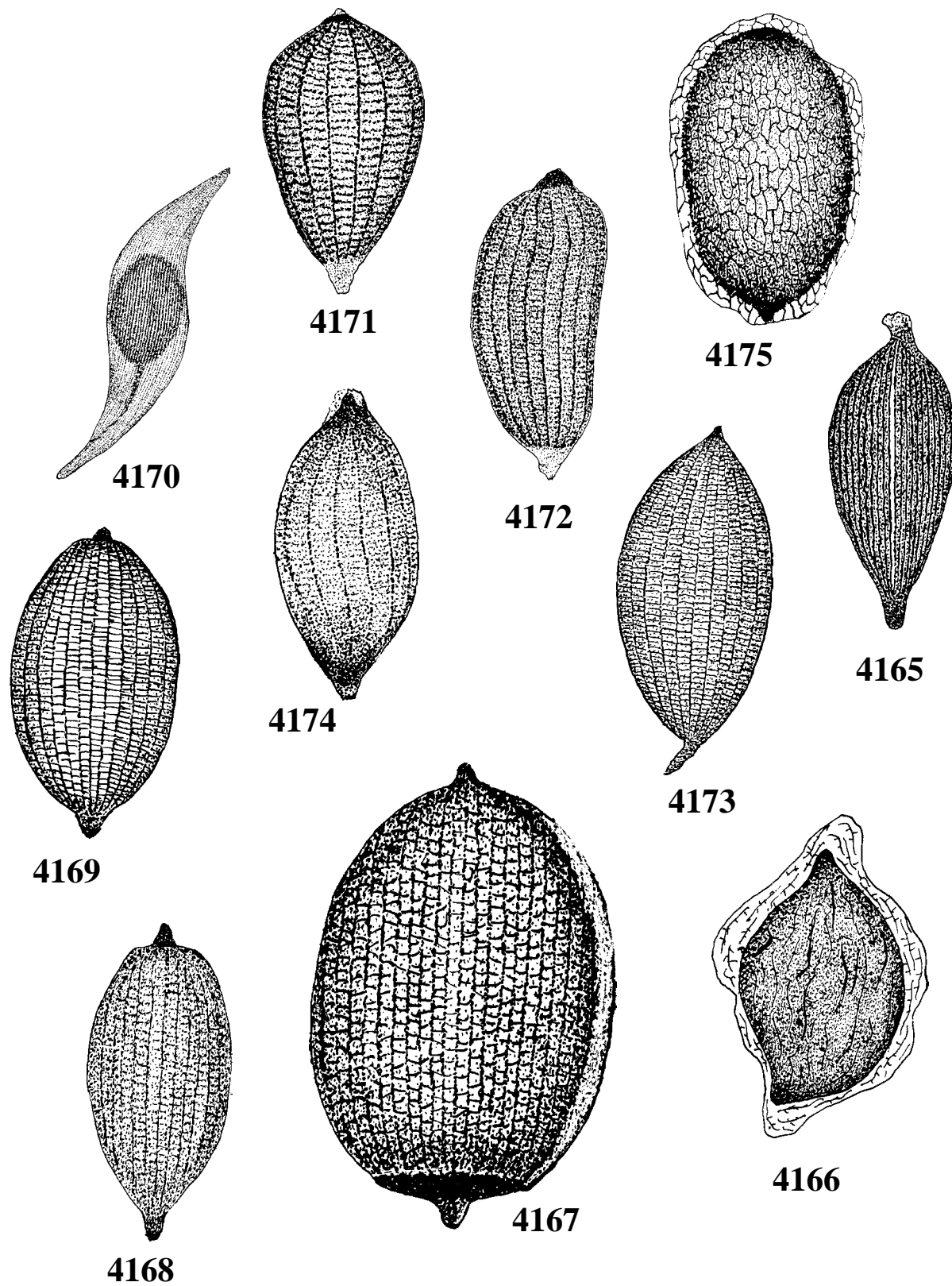
**4172. *Juncus conglomeratus*** L., *J. leersii* T. Marsson — Perennial, densely tufted, light-green, stems 40-100 cm high, erect, up to 4 mm in diam., leafless, with 10-30 ribs. **Seeds cylindric or obovate, apex acuminate, bottom hyaline, inside with hilum, 0.4-0.5 x c. 0.2 mm. Surface longitudinal ribbed and transversal runged, slight lustrous, pale-brown, apex and bottom dark-brown. 2n = 42 (40).** Native to Europe, wet meadows, springheads, fenlands, peatbogs and wet roads; in all Carpathian territories.

**4173. *Juncus dudleyi*** Wiegand — Perennial, densely caespitose, stems 10-80 cm high, leaves only 1/3 as long as the stem, auricles short, cartilaginous, yellowish. **Seeds spindle-shaped, narrowed at both ends, 0.45-0.55 x c. 0.25 mm. Surface longitudinal furrowed, transversal runged, lustrous, brown. 2n = 84.** Originally growing in temperate North America, causal in central Europe. Ro, Sk.

**4174. *Juncus effusus*** L., *J. communis* var. *effusus* (L.) E. Mey. — Perennial, densely tufted, bright-green, stem erect, 50-150 cm high, longitudinally striate, leaves only ground. **Seeds spindle-shaped, apex with membranous residue, c. 0.5 x 0.25 mm. Surface longitudinal ribbed and transversal runged, slight lustrous, yellowish-brown. 2n = 42.** Native to circumpolar territories, moist meadows and pastures, meadow swamps, river and pond banks; throughout the Carpathians.

**4175. *Juncus filiformis*** L., *J. trichodes* Steud. — Perennial, scarcely tufted, stems erect, 10-60 cm high, thin,  $\pm$  1 mm in diam., faint striate, roundish. **Seeds**





elliptic, with semitransparent hem, 0.6-0.7 x c. 0.4 mm. Surface smooth, with visible cell texture of the whitish and transparent cover, lustrous, pale-brown.  $2n = (80) 84$ . Native to circumpolar territories, moist, sandy places, moist meadows, swamps, peatbogs, riverbanks; in cooler areas of all Carpathian regions.

**4176. *Juncus gerardii*** Loisel., *J. attenuatus* Viv. — Perennial, tufted, stems erect, rigid, 5-50 cm high, roundish or slightly flattish, with 0-2 leaves on stem, 4-5 basal leaves. **Seeds obovate, ventral side with raphe, apex with outgrowth, bottom hyaline with hilum inside, 0.5-0.7 x 0.3-0.4 mm. Surface longitudinal ribbed and transversal runged, slight lustrous, brown.  $2n = 84$ .** Native to Eurasia, moist, saline meadows, pastures and other saline grounds; throughout the Carpathians.

**4177. *Juncus inflexus*** L., *J. glaucus* Sibth. — Perennial, densely tufted, glaucous, greyish-green, stems erect, 50-120 cm high, 10-20 ribbed, inflorescence multiflowered. **Seeds broad spindleshaped, apex and bottom gradually narrowed, enclosed in transparent cover, 0.5-0.6 x c. 0.3 mm. Surface indistinctly longitudinal furrowed and transversal runged, slight lustrous, reddish-brown.  $2n = 40$ .** Native to Eurasia, wet meadows and roads, quiet riverbanks, swamps of all Carpathian territories.

**4178. *Juncus maritimus*** Lam. — Perennial, semirobust up to robust, stems rigid, 50-100 cm high, 2-3 mm in diam. **Seeds broadly spindleshaped or elliptic, wrapped into transparent membrane, 0.6-0.8 x 0.3-0.35 mm. Surface longitudinal ribbed, slight lustrous, dark-brown, membrane whitish.  $2n = 48$ .** Native to Eurasia, Africa, America and Australia, moist sandbanks, swamps of sea and lake margins. Hu, Pl, Ro, Uk.

**4179. *Juncus minutulus*** Albert et Jahandiez — Annual, tufted, stems 1-15 cm high, scarcely single, thin, erect or ascendent. **Seeds barrel-like or elliptic, apex truncate, bottom  $\pm$  truncate with funiculus, 0.4-0.5 x 0.25-0.35 mm. Surface longitudinal dense striate, slight lustrous, pale-brown.  $2n = 72$ .** Native to Europe, moist to wet sandbanks and roads. Ro, Sk.

**4180. *Juncus ranarius*** Song et Perr., *J. ambiguus* auct. non Guss. — Annual, plant with many stems, 3-20 cm high, erect or ascending, flowers in capitulate clusters. **Seeds barrel-shaped or ellipsoid, apex and bottom  $\pm$  truncate, 0.35-0.45 x 0.25-0.35 mm.**

**Surface scalariform, lustrous, yellowish-brown.** Native to northern, central and eastern Europe, salt-marshes, wet grasslands, damp, open habitats, mainly near coasts. Br, Hu, Mo, Pl, Ro, Sk.

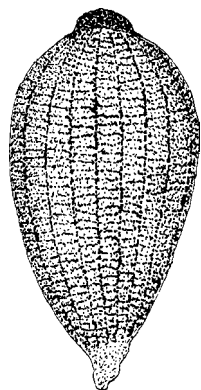
**4181. *Juncus sphaerocarpus*** Nees — Annual, tufted, stems 5-30 cm high, erect, thin up to filiform,  $\pm$  ramified, numerous basal leaves. **Seeds ellipsoid or obovate, apex and bottom acuminate, c. 0.35 x 0.2 mm. Surface longitudinal dense ribbed, lustrous, yellowish-brown.  $2n = 36$ .** Originally growing in circumpolar territories, moist and sandy meadows, overflowed pastures and fields, river and pond banks. Hu, Sk, Uk.

**4182. *Juncus squarrosus*** L., *J. squamosus* Link — Perennial, densely tufted, stems rigid, 15-30 cm high, weakly compressed, with one leaf or a sheath only. **Seeds oval or obovate with longitudinal raphe on ventral side and overgrowth on bottom part, 0.7-0.8 x c. 0.5 mm. Surface longitudinal ribbed and transversal runged, slight lustrous, pale- or dark-brown.  $2n = 42 (40)$ .** Native to Europe, moist pastures, forest roads, wet sandbanks, fenland margins, springheads and peatbogs. Br, Pl, Sk, Uk.

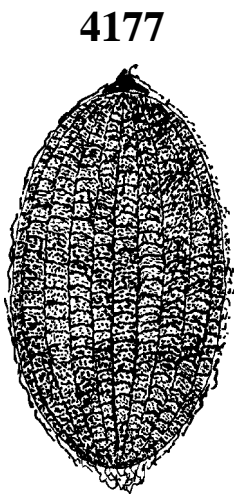
**4183. *Juncus subnodulosus*** Schrank, *J. obtusiflorus* Ehrh. ex Hoffm. — Perennial, scarcely tufted, stems erect, 40-130 cm high, rigid, smooth, roundish. **Seeds spindleshaped or pyriform, apex acuminate, bottom with funiculus, 0.5-0.6 x 0.25-0.35 mm. Surface reticulate, slight lustrous, brown.  $2n = 40$ .** Native to Europe, dry fenlands, meadow swamps and boundaries. Hu, Pl, Ro, Sk, Uk.

**4184. *Juncus tenageia*** L. fil. — Annual, tufted, stems thin, rarely ascendent, 5-35 cm high, branched from base, usually with 3 leaves. **Seeds elliptic or obovate, apex and bottom acuminate, 0.4-0.5 x 0.2-0.25 mm. Surface longitudinal conspicuous striate, lustrous, reddish-brown.** Native to Europe, moist meadows, boundaries, stagnant water banks, non-calcareous, loamy and sandy soils. Hu, Mo, Pl, Uk.

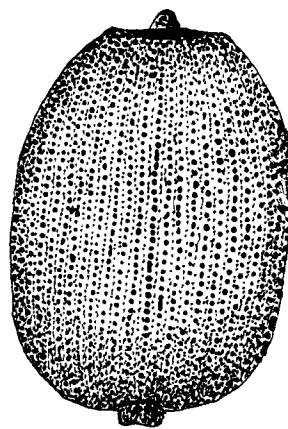
**4185. *Juncus tenuis*** Willd., *J. macer* Gray — Perennial, densely caespitose, stem 10-80 cm high, rigid to weak, with a few basal sheaths and 2-3 basal cauline leaves. **Seeds obliquely ovoid, with short beak at apex, and/or with wing, 0.4-0.5 x c. 0.25 mm. Surface longitudinal fine ribbed and transversal runged, lustrous, yellowish-brown.  $2n = 84$ .** Native to temperate North America, natural-



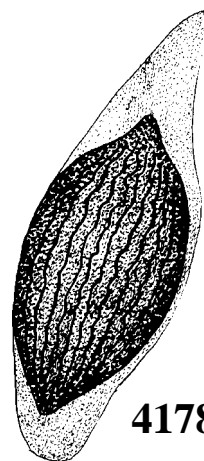
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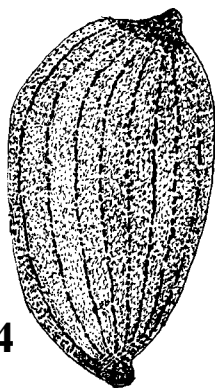
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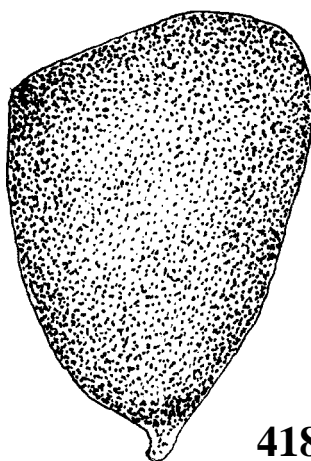
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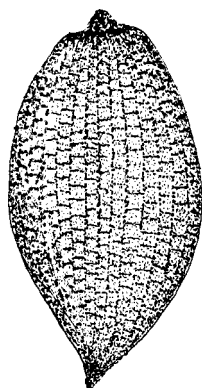
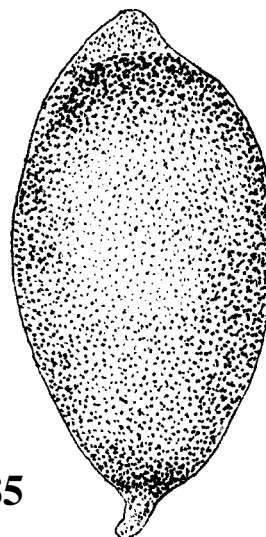
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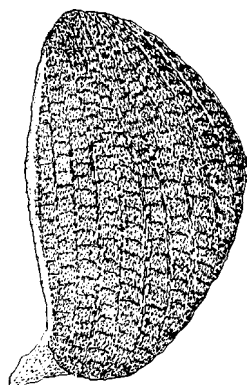
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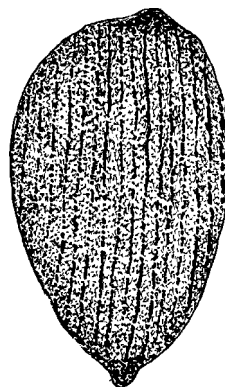
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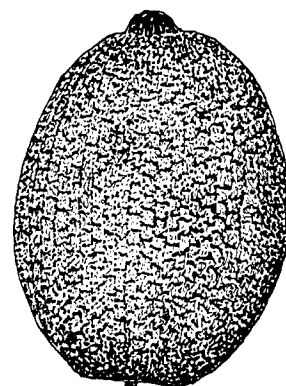
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ized in Europe, on damp grasslands, roadsides, damp open habitats; in all Carpathian regions.

**4186. *Juncus thomasi*** Ten., *J. macedonicus* Beauverd, *J. rochelianus* Schult. et Schult. fil. — Perennial, stems 25-100 cm high, with 0-2 basal sheaths and 2-4 cauline leaves, inflorescence dense, with 50-200 smaller heads. **Seeds elliptic or pyriform, pointed at both ends, c. 0.5 x 0.2 mm. Surface glabrous, slight lustrous, brown.** Native to the southeastern Carpathians and the Balkan Peninsula, wet mountain meadows. Pl, Ro, Sk, Uk.

**4187. *Juncus trifidus*** L. — Perennial, densely tufted, stems erect, thin roundish, 5-30 cm high, peak inflorescence, 2 to 4 flowered. **Seeds elliptic, enclosed in transparent cover, 1-1.3 x 0.6-0.7 mm. Surface longitudinal ribbed and furrowed, high lustrous, greyish-brown. 2n = 30.** Native to circumpolar territories, grassy alpine meadows, reinforced screes and rocks. Pl, Ro, Sk, Uk.

**4188. *Juncus trifidus*** subsp. *monanthos* (Jacq.) Ascherson et Graebner, *J. monanthos* Jacq. — Perennial, stems 20-40 cm high, uppermost basal sheath with lamina up to 10 cm high, cauline leaves 2 or 3, usually 1-flowered. **Seeds richly arranged, mostly oblong or roundish, lateral compressed, winged around, 1.6-1.8 x 1-1.2 mm. Surface longitudinal fine striate, lustrous, brown, margin pale-brown.** Native to the higher mountains of Europe, usually on cliffs or rocks. Ro.

**4189. *Juncus triglumis*** L., *J. biglumis* Krock. non L. — Perennial, scarcely tufted, stems erect, 5-20 cm high, roundish, hollow, with several leaves at base. **Seeds elliptic, enclosed in transparent membrane, 1.5-1.8 x 0.3-0.4 mm. Surface longitudinal ribbed, lustreless, reddish-brown. 2n = 130, 134.** Native to circumpolar territories, springheads and swampy meadows. Pl, Ro, Sk, Uk.

**4190. *Luzula alpinopilosa*** (Chaix) Breistr., *L. spadicea* (All.) DC. — Plant 15-50 cm high, caespitose, stems erect or ascending, thin, 20-40 cm high, basal leaves linear, 1-8 mm wide. **Seeds ellipsoidal, dorsal side convex, ventral slight flattish, with longitudinal, white raphe and arils at both ends, 1.2-1.4 x 0.7-0.8 mm. Surface glabrous, lustrous, pale-brown. 2n = 12.** Native to the Carpathians, moist wastes, riverheads, wet rocks, snow-lying margins. Pl, Ro, Sk, Uk.

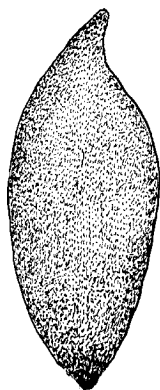
**4191. *Luzula campestris*** (L.) DC., *Juncus campestris* L. — Perennial, scarcely tufted, stems 10-30 cm high, erect, sparsely leafy. **Seeds spherical, ventral side with longitudinal raphe, apex with small beak, bottom with large aril, 1.4-1.7 x 0.9-1.1 mm. Surface longitudinal ribbed and furrowed, slight lustrous, violet-brown. 2n = 12.** Native to Europe, sunny, grassy hills and slopes, dry meadows and pastures, boundaries. Hu, Mo, Pl, Ro, Sk, Uk.

**4192. *Luzula divulgata*** Kirschner — Perennial, densely tufted, stems 15-30 cm high, erect, scarcely leafy ground leaves linear. **Seeds ellipsoid or obovoid, ventral side slight flattish with raphe, apex with small yellowish caplet, bottom with large and long aril (0.6-0.8 mm), 1.4-1.6 x 1-1.2 mm. Surface granulate, slight lustrous, reddish-brown. 2n = 24.** Native to Europe, light woodlands, forest edges, cut-over areas, forest steppe hills and slopes, mostly stony and loamy grounds. Sk.

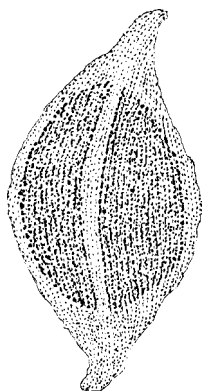
**4193. *Luzula forsteri*** (Sm.) DC., *Juncus forsteri* Sm., *J. nemorosus* Savi — Perennial, plant dark-green, stems gracile, erect, 20-40 cm high, glabrous. **Seeds obovate, ventral side slight flattish or rooflike with raphe apex with small beak, bottom with huge yellowish to dark-yellowish aril, 1.3-1.6 x 0.8-0.9 mm. Surface faint reticulate, lustrous, reddish-brown. 2n = 24.** Native to Eurasia and northern Africa, moist woods, shrubberies of montane and subalpine zones. Hu, Ro, Uk.

**4194. *Luzula luzulina*** (Vill.) Racib., *L. flavescens* (Host) Gaudin — Perennial, light-green, scarcely tufted, stems erect, thin, 10-25 cm high, leaves 2-6 mm wide. **Seeds ovate, ventral side slight flattish with raphe, apex with small whitish caplet, bottom with large aril, 1.3-1.7 x 0.9-1.1 mm. Surface longitudinal striate, lustreless, reddish-violet. 2n = 24.** Native to Europe, light beech-fir and mountain spruce woods on stony-loamy grounds. Pl, Ro, Sk, Uk.

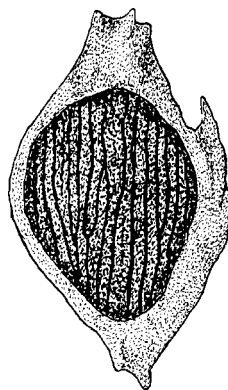
**4195. *Luzula luzuloides*** (Lam.) Dandy et Wilmott, *Juncus luzuloides* Lam., *L. albida* (Hoffm.) DC. — Perennial, freely tufted, stem erect, 30-70 cm high, sparsely leafy. **Seeds elliptic, dorsal side roundish, ventral side slight flattish with yellowish raphe, 1.1-1.3 x 0.6-0.8 mm. Surface faint longitudinal striate, lustrous, reddish-violet. 2n = 12.** Native to Europe, light woodlands, forest cut-over areas, meadows in stony, sandy and loamy soils. Br, Hu, Pl, Ro, Sk, Uk.



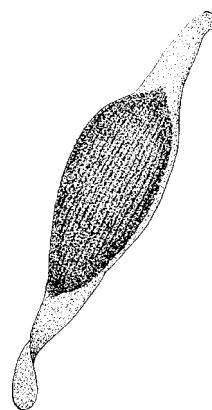
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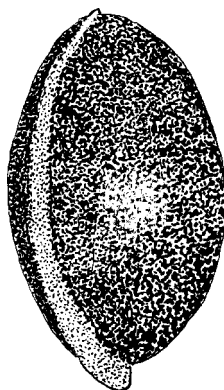
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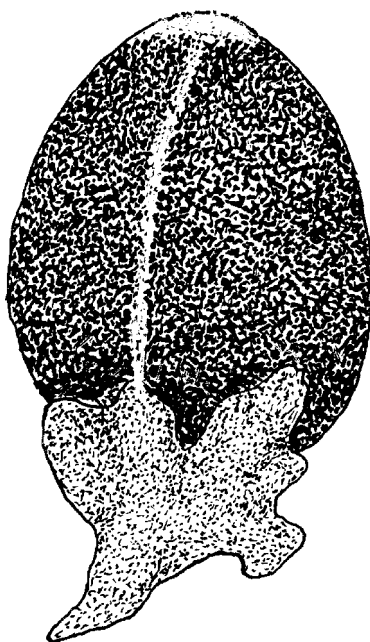
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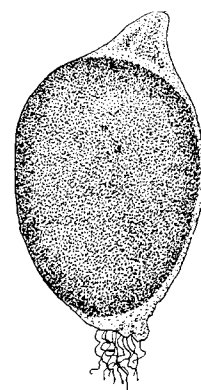
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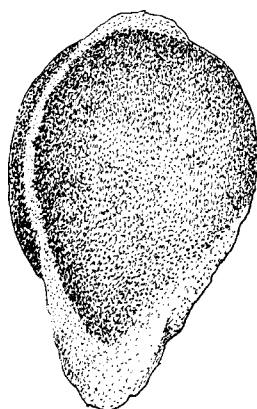
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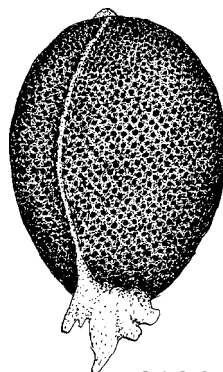
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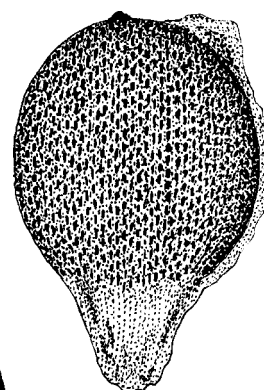
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**4196. *Luzula multiflora*** (Ehrh.) Lej., *L. erecta* Desv. — Perennial, densely tufted, stems erect, 10-50 cm high, sparsely leafed. **Seeds elliptic, apex with beak, bottom with whitish aril, 1.4-1.6 x 0.75-0.85 mm. Surface longitudinal ribbed, lustrous, violet-brown. 2n = (24) 36.** Native to circumpolar territories, light and moister woods, forest margins and clearings, shrubby slopes, bilberry pine woods. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4197. *Luzula nivea*** (L.) Lam. et DC., *Juncus niveus* L. — Perennial, light-green, stems erect or ascendent, 50-80 cm high, leaves linear, c. 30 cm long. **Seeds elliptic, ventral side slight flattish or rooflike, with raphe, apex with caruncle, bottom with small aril and some faint hairs, 1.1-1.4 x 0.7-0.9 mm. Surface longitudinal striate, lustrous, reddish-brown.** Native to southern Europe, forest meadows and cut-over areas, woodland edges of montane and subalpine zones. Ro (?).

**4198. *Luzula pallidula*** Kirschner, *L. pallescens* auct. non Sw. — Perennial, densely tufted, pale-green, stems filiform, 10-40 cm high, 1 mm in diam. **Seeds elliptic, dorsal side roundish, ventral side slight flattish or rooflike with raphe, apex with small caplet, bottom with aril, 0.9-1.1 x 0.5-0.6 mm. Surface longitudinal striate, slight lustrous, reddish-brown. 2n = 12.** Native to Eurasia, dry areas, sunny forest meadows and cut-over areas, roadside verges of the montane zone; in all Carpathian territories.

**4199. *Luzula pilosa*** (L.) Willd., *L. vernalis* DC., *Juncus pilosus* L. — Perennial, grassy green, densely tufted, stems  $\pm$  erect, 15-35 cm high, ground leaves linear. **Seeds ovoid, ventral side with whitish raphe, apex with whitish spot, bottom with prolonged aril, 1.3-1.6 x 1.1-1.3 mm. Surface granulate, lustrous, reddish-violet. 2n = 66, 72.** Native to Euro-Siberia, moister woodlands and shrubby canyon forests. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4200. *Luzula spicata*** (L.) DC., *L. glomerata* Mill. — Perennial, densely tufted, stems  $\pm$  erect, 7-25 cm high, basal leaves narrowly linear, 1-4 mm wide. **Seeds ellipsoid, dorsal side roundish, ventral flattish or slight rooflike with rib, apex with beak, bottom with small aril, 1.1-1.5 x 0.7-0.8 mm. Surface smooth, lustreless, whitish-pink.** Native to circumpolar territories, rocks, reinforced screes, grassy and stony mountain meadows on poor, acid and stony soils. Pl, Ro, Sk, Uk.

**4201. *Luzula sudetica*** (Willd.) Schult., *Juncus sudeticus* Willd. — Perennial, scarcely tufted, stems erect, 10-30 cm high, ground leaf narrowly linear. **Seeds elliptic, ventral side with raphe, apex with beak, bottom with large aril, 1.4-1.7 x 0.7-0.9 mm. Surface longitudinal ribbed, slight lustrous, reddish-brown. 2n = 48 (54).** Native to Europe, light woods, dryer mountain meadows, dwarf pine areas, on moist, poor, sandy, stony, peaty and loamy soils. Pl, Ro, Sk, Uk.

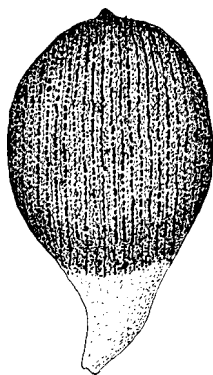
**4202. *Luzula sylvatica*** (Huds.) Gaud., *L. maxima* DC., *Juncus sylvaticus* Huds. — Perennial, robust, freely tufted, stems erect, leafy, 30-80 cm high, basal leaves in rosette. **Seeds elliptic, dorsal side roundish, ventral slight flattish or rooflike with whitish rib, apex with small beak, bottom with small aril, 1.3-1.7 x 0.8-1 mm. Surface faint, longitudinal striate, slight lustrous, greyish-violet. 2n = 12.** Native to Europe, humous, leafy and coniferous woodlands, dwarf pine areas, mountain and alpine meadows. Pl, Ro, Sk, Uk.

### 173. CYPERACEAE

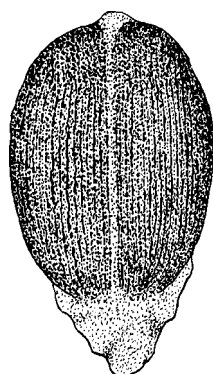
**4203. *Schoenus ferrugineus*** L., *Chaetospora ferruginea* Rchb. — Perennial, stems 10-30 cm high, tufted, leaves shorter than half of the stem. **Fruits achenes, ovoidal, with 3 longitudinal ribs, 3 stronger and 3 weaker very long bristles, 1.3-1.6 x 0.7-0.8 mm. Surface smooth, lustrous, greyish-brown. 2n = 76.** Native to Europe, fenlands, dried fens and wet meadows. Br, Pl, Ro, Sk, Uk.

**4204. *Schoenus nigricans*** L. — Perennial, stems 15-60 cm high,  $\pm$  2x longer than leaves, inflorescence with 5-10 spikelets. **Fruits achenes,  $\pm$  spherical, blunt 3-angular, apex and bottom narrowed, 1.4-1.6 x 0.9-1.1 mm. Surface smooth, lustrous, milky-white. 2n = 44, 54.** Native to circumpolar territories, on fenlands, wet meadows, swamps, overflowed calcareous soils. Br, Hu, Pl, Ro, Sk, Uk.

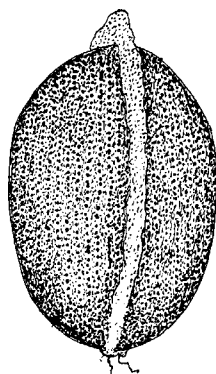
**4205. *Rhynchospora alba*** (L.) Vahl, *Schoenus albus* L. — Perennial, tufted, stems erect, 10-40 cm high, ground, leaves 10-15 cm x 1-2 mm, rough, leaves of stem shorter. **Fruits achenes,  $\pm$  spherical, apex prolonged acuminate, perigon from 8-13 bristles (with hairlets tended to below), 2.2-2.6 x 1-1.2 mm. Surface smooth, lustrous, yellowish-brown. 2n = 26 (42).** Native to circumpolar territories, on drying up fenlands, wet sandbanks, occasionally overflowed grounds. Br, Hu, Pl, Ro, Sk, Uk.



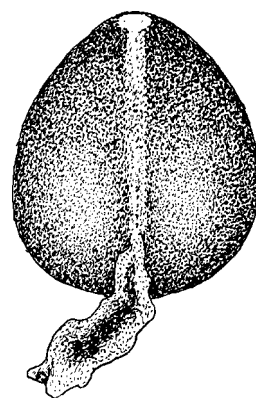
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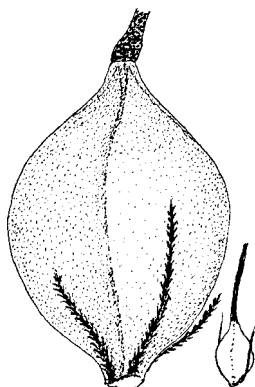
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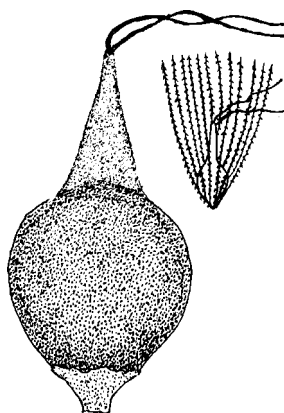
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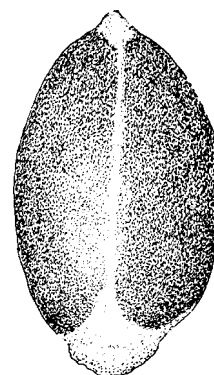
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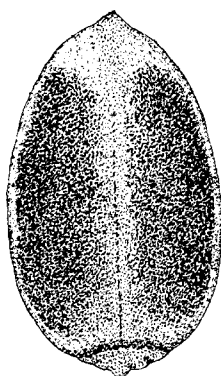
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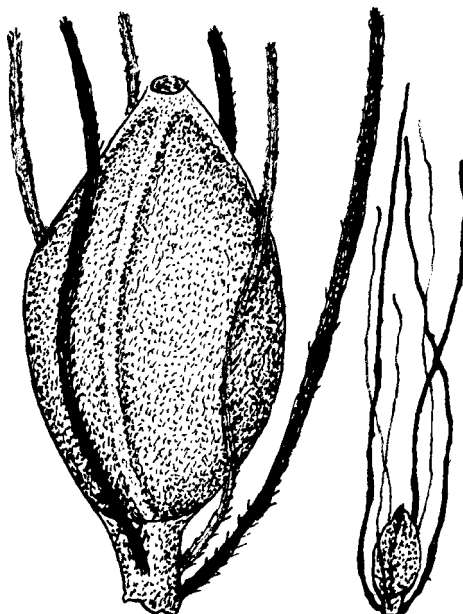
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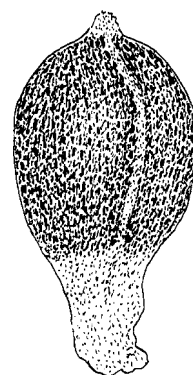
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**4206. *Rhynchospora fusca* (L.) Ait. fil.** — Perennial, stems 15-35 cm, faint tufted, leaves up to 15 cm x 1 mm, inflorescence with 10-40 flowers. **Fruits achenes, globose or spherical, perigon with 5-6 bristles and upright small hairs, apex with shortly obovate or obconic beak, 1.9-2.2 x 0.9-1.1 mm. Surface smooth, lustrous, rusty-brown. 2n = 32.** Native to circumpolar territories, on transient peat-moss, heathery lands, on wet, from time to time overflowed sour areas. Pl, Uk.

**4207. *Juncellus serotinus* (Rottb.) Clarke, *Cyperus serotinus* Rottb.** — Perennial, stems 30-100 cm high, sharply triangular, leaves longer than stems, linear, angular, inflorescence umbrella-like. **Fruits achenes, ovoid, lateral compressed, apex with small beak, bottom gradually narrowed, 1.5-1.7 x 1.2-1.3 mm. Surface fine granulate, lustrous, brown.** Native to southeastern Europe, muddy meadows and river deposits. Hu, Mo, Ro, Uk.

**4208. *Fimbristylis annua* (All.) R. et Sch., *Scirpus annuus* All.** — Annual, stems 5-20 cm high, bluntly 3-angular. **Fruits achenes, obovate, apex truncate with stylopodium, bottom gradually narrowed into hilum, 1.1-1.3 x 0.8-0.9 mm. Surface longitudinal ribbed and transversal runged, lustrous, pale- or dark-brown.** Native to Eurasia, rare in moist places. Ro (?).

**4209. *Fimbristylis bisumbellata* (Forskål) Bubani, *F. dichotoma* auct. non (L.) Vahl., *Scirpus dichotomus* L.** — Annual (perennial), caespitose, glaucous, semiprocumbent to erect, stems up to 25 cm high, inflorescence usually spreading. **Fruits achenes, elliptic, dorsal side rooflike with rib on card edge, ventral side flat or slight concave, apex with beak, 1.4-1.8 x 0.5-0.7 mm.** Native to southern Europe, riverbanks and rice fields. Ro, Uk.

**4210. *Cyperus alternifolius* L.** — Perennial, caespitose, stems 60-90 cm, bracts 8-12, with revolute margins, inflorescence a compound umbel of rather dense head. **Fruits achenes, oval, lateral slight flat-tish, dorsal side convex, ventral rooflike, 0.8-0.9 x 0.4-0.5 mm. Surface fine granulate, slight lustrous, yellowish-brown.** Native to Africa; in the Carpathians rarely cultivated for ornament, seldom naturalized.

**4211. *Cyperus difformis* L.** — Annual, caespitose, stems 20-75 cm high, leaves 2-7 mm wide, shorter than the stems, spikelets linear, with 10-40 flowers. **Fruits achenes, obovoid to triangular, dorsal side**

**rooflike with longitudinal rib, ventral side flat or slight concave, 0.6-0.7 x 0.3-0.35 mm. Surface smooth, faint lustrous, pale-yellow.** Native to southern Europe, mostly in rise fields, moist and boggy places. Ro, Uk.

**4212. *Cyperus fuscus* L.** — Annual, tufted, stems 3-35 cm high, leafy below, erect or procumbent, 3-sided,  $\pm$  longer than the leaves. **Fruits achenes, trigonous, broad spindleshaped, apex narrowed into beak and bottom into hilum, 1-1.1 x 0.4-0.5 mm. Surface smooth, lustreless or dull, coloured sandy. 2n = 72.** Native to Eurasia, wet sandbanks, denuded pond bottoms, fenland meadows, springheads, wet roadsides and banks of water ditches; in all Carpathian regions.

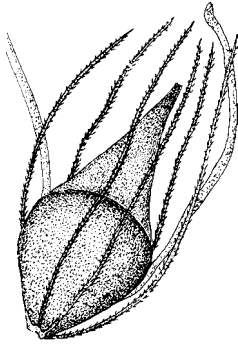
**4213. *Cyperus papyrus* L.** — Perennial, caespitose, leafless, stem 2-5 m high, inflorescence a compound umbel, with 100-200 rays, 12-20 cm long. **Fruits achenes, trigonous, dorsal side rooflike, ventral flat or concave, 0.9-1.1 x 0.3-0.45 mm. Surface smooth, lustreless, greyish-brown.** Native to central Africa and the Nile valley; in the Carpathians cultivated as rarity in botanical gardens and parks.

**4214. *Pycnus flavescens* (L.) Rchb., *Cyperus flavescens* L.** — Annual, densely tufted, stems ascendent, 5-50 cm high, thin, bluntly 3-angular, 2-leafed below. **Fruits achenes, spherical, apex narrowed into beak and bottom into hilum, 0.9-1.1 x c. 0.7 mm. Surface faint wrinkly, lustrous or dull, reddish-brown or dark greyish-brown. 2n =  $\pm$  50.** Native to Eurasia, at present a cosmopolitan, fenlands, stagnant-water banks, springheads, boundaries, wet roadsides; throughout the Carpathians.

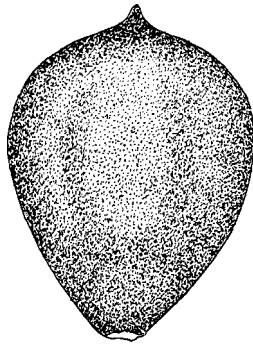
**4215. *Acorellus pannonicus* (Jacq.) Palla, *Cyperus pannonicus* Jacq.** — Annual to perennial, erect or caespitose, usually leafless, stems 5-40 cm high, spikelets broadly lanceolate or ovate, with 10-40 flowers, ascending. **Fruits achenes, oval, slight flat-tish, apex narrowed into small beak, 1.8-2.2 x 1.3-1.5 mm. Surface slight lustrous, yellowish-brown. 2n = 68-76.** Native to Europe, saline stands, moist, soils dry in summer. Hu, Mo, Ro, Sk, Uk.

**4216. *Dichostylis micheliana* (L.) Nees, *Cyperus michelianus* (L.) Link** — Annual, tufted, greyish-green, stems erect or ascendent, up to 30 cm high, leafy only at base. **Fruits achenes, prolonged trigonous, flat-tish, apex narrowed into beak, bottom narrowed**

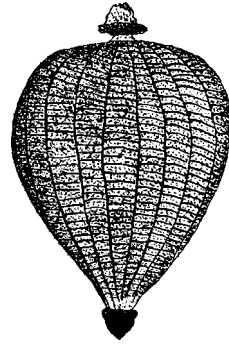




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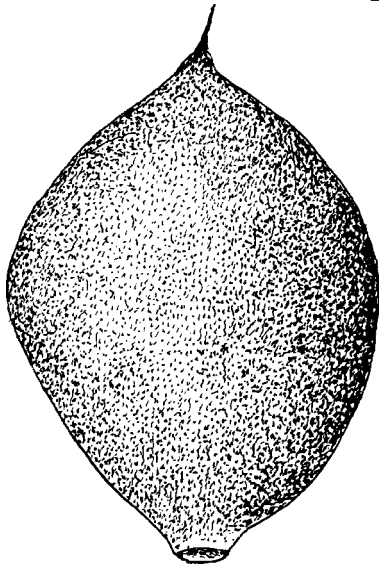
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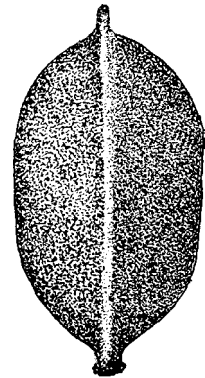
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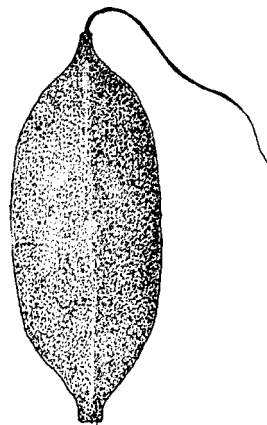
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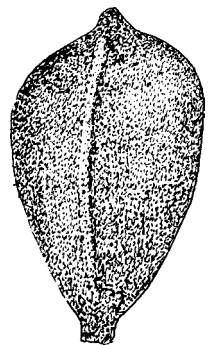
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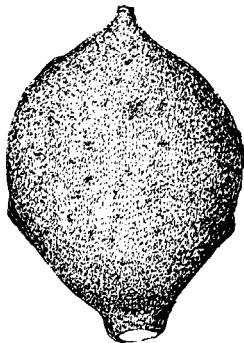
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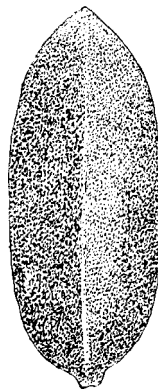
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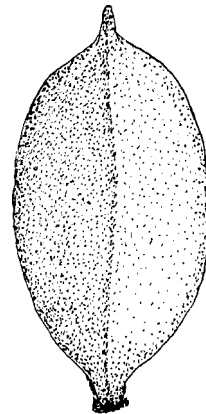
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4212

into hilum, 1-1.2 x 0.3-0.4 mm. Surface faint waved, lustreless, light or sandy-brown. Native to Eurasia, overflowed sandbanks of ponds; in all Carpathian territories.

**4217. *Chlorocyperus esculentus* (L.) Hayek, *Cyperus esculentus* L.** — Annual to perennial, stems 5-60 cm high, single, leaves  $\pm$  length of the stem linear. **Fruits achenes, prolonged, 3-sided or angular, dorsal side roundish, ventral rooflike, 2 sides  $\pm$  flat, with beak on apex, 1.5-1.7 x 0.6-0.8 mm. Surface granular, lustrous, pale-brown.  $2n = (18) 108$ .** Native to southern Europe; in the Carpathians rarely cultivated in fields as oil-yielding plant with edible bulbs. Sk, Uk.

**4218. *Chlorocyperus glomeratus* (L.) Hayek, *Cyperus glomeratus* L.** — Perennial (annual), grey-green, stems erect, 30-70 cm high, single or tufted, 3-angular. **Fruits achenes, prolonged, 3-sided, apex with beak, bottom narrowed into hilum, 1.2-1.4 x 0.35-0.45 mm. Surface faint dense reticulate-foveate, lustrous, greyish-brown.** Native to Eurasia, wet sandbanks and muddy riverbanks, wet fields and overflowed meadows. Hu, Ro, Sk, Uk.

**4219. *Chlorocyperus longus* (L.) Palla, *Cyperus longus* L., *C. preslii* Parl.** — Perennial, stems single, 20-150 cm high, leaves  $\pm$  length of the stem. **Fruits achenes, trigonous or angular, all sides  $\pm$  flat, dorsal side rooflike, apex with thin beak, 1.2-1.4 x 0.5-0.6 mm. Surface longitudinal granulate, slight lustrous, greyish-brown.** Native to Eurasia, pond and riverbanks, wet, humous and muddy grounds. Ro, Sk, Uk.

**4220. *Eriophorum angustifolium* Honck., *E. polystachyon* L. p. p.** — Perennial, stems 30-75 cm high, roundish, 3-angular in upper half, leafy. **Fruits achenes, oblanceolate, 3-sided, ventral side  $\pm$  flat, dorsal rooflike, 2 sides also flat, apex with small beak, bottom gradually narrowed into hilum, 2.5-3 x 1-1.3 mm. Surface dense lineate, faint lustrous, brown to blackish-brown.  $2n = 58$ .** Native to Eurasia and North America, on heathery lands, peatbogs, swampy meadows, springheads, brookbanks. Br, Hu, Pl, Ro, Sk, Uk.

**4221. *Eriophorum gracile* Koch ex Roth** — Perennial, sparsely caespitose, slender, stems erect, thin, 20-50 cm high, 3-angular, leafy only in the lower half. **Fruits achenes, spindle-shaped, lateral compressed, dorsal side slight rooflike, ventral**

**flat, 3.2-3.5 x 1.3-1.5 mm. Surface smooth, faint lustrous, yellowish-brown.  $2n = 60, 76$ .** Native to Europe, wet meadows, moors, peatbogs and springheads. Br, Pl, Ro, Sk, Uk.

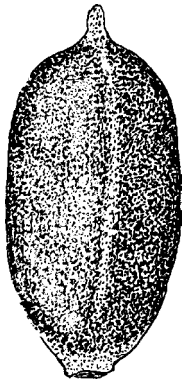
**4222. *Eriophorum latifolium* Hoppe** — Perennial, scarcely tufted, stems erect, 20-70 cm high, 3-angular, leafy, leaves linear, 3-7 mm wide. **Fruits achenes, oblanceolate, trigonous, all sides flattish, apex with style hilum, bottom gradually narrowed into hilum, 2.9-3.5 x 1.2-1.5 mm. Surface dense longitudinal lineate, reddish-brown.  $2n = 54, 58, 72$ .** Native to Eurasia, springheads, meadow swamps, fenlands; in all Carpathian regions.

**4223. *Eriophorum scheuchzeri* Hoppe, *E. capitatum* Host** — Perennial, stems single, erect, 10-35 cm high, roundish, leafy only at base. **Fruits achenes, prolonged obovoid, 3-sided or angular, all flattish or slight convex, apex with small beak, bottom gradually narrowed into hilum, 2-2.5 x 0.6-0.8 mm. Surface dense longitudinal lineate, lustreless, pale-brown.  $2n = 58$ .** Native to Eurasia and North America, peatbogs, overgrown water ditches, springheads. Pl, Ro, Sk, Uk.

**4224. *Eriophorum vaginatum* L.** — Perennial, densely tufted, stems erect, 30-60 cm high, roundish below, 3-angular above, lower half sheathy and leafy. **Fruits achenes, obovoid, 3-sided or angular, all sides flattish or slight convex or depressed, 2.8-3.2 x 1.6-1.8 mm. Surface fine longitudinal lineate, lustrous, dark-brown.** Native to Eurasia and North America, heathery lands, peatbogs, forest swamps, wet, poor and acid soils. Br, Hu, Pl, Ro, Sk, Uk.

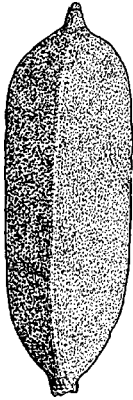
**4225. *Trichophorum alpinum* (L.) Pers., *Baeothryon alpinum* (L.) T. V. Egorova** — Densely tufted, greyish-green, stem erect, 10-40 cm high, sheathy at base, 3-angular, rough above. **Fruits achenes, obovoid, 3-sided or angular, all sides flattish or slight convex, apex with small beak, bottom gradually narrowed, 1.1-1.3 x 0.5-0.6 mm. Surface faint longitudinal lineate, lustreless, dark-brown.  $2n = 58$ .** Native to Eurasia and North America, wet, from time to time overflowed areas, such a heathery lands, peatbogs, moistly rocks and pond banks. Br, Hu, Pl, Sk.

**4226. *Trichophorum caespitosum* (L.) Hartm., *Baeothryon caespitosum* (L.) A. Dietr.** — Perennial, densely tufted, stems 5-35 cm high, oval, smooth, enclosed at base in sheaths. **Fruits achenes, obovoid,**

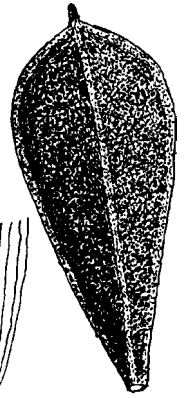
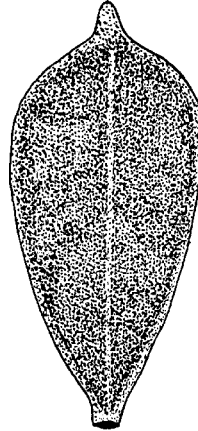


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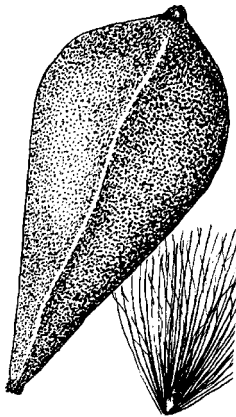
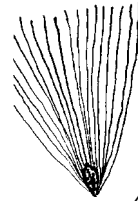
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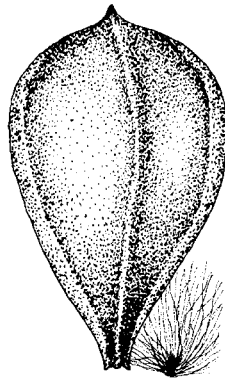
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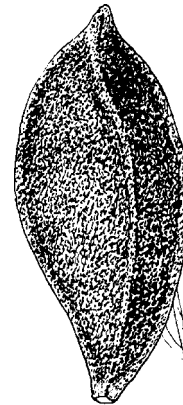
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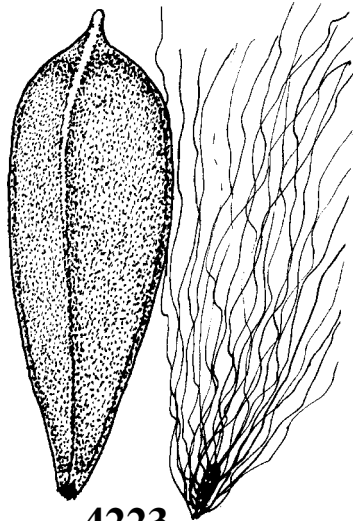
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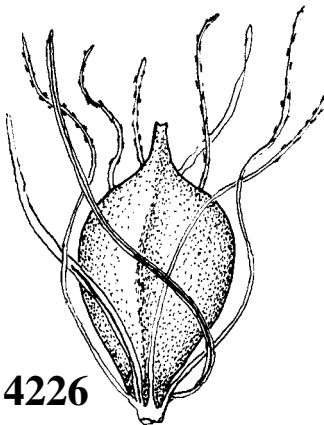
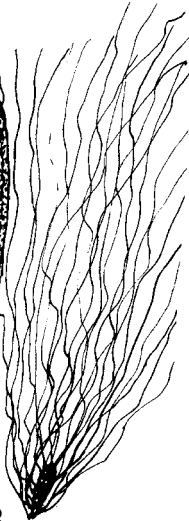
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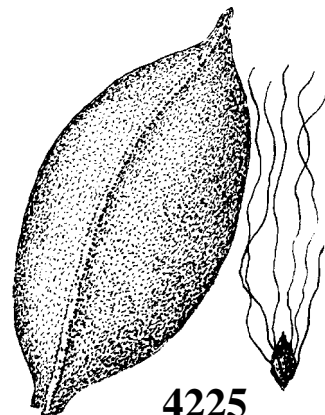
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4225



3-sided or angular, all sides slight convex, apex with beak, bottom truncate with whitish corona and 5-6 smooth hairs, 1.8-2.2 x 0.9-1.1 mm. Surface faint longitudinal lineate, lustreless, greyish-brown.  $2n = 104$ . Native to Eurasia, moist meadows and pastures, peatbogs and heathery hillsides. Pl, Sk.

**4227. *Eleocharis acicularis* (L.) Roem. et Schult., *Scirpus acicularis* L.** — Perennial, tiny, untufted, stems fine, filiform, thin, 2-10 cm high, 4-angular, in submerged non-flowering plant up to 50 cm long. **Fruits achenes, obovoid or obconic, apex with caplet, bottom gradually narrowed, 0.9-1.1 x 0.45-0.5 mm. Surface longitudinal ribbed and transversal runged, lustreless, yellowish-white.**  $2n = 20$ . Native to Eurasia and North America, wet meadows, banks of stagnant waters, boundaries, denuded bottoms of ponds; throughout the Carpathians.

**4228. *Eleocharis austriaca* Hayek, *E. mamillata* subsp. *austriaca* (Hayek) Strandh.** — Perennial, stems soft, 10-50 cm high, spikelets with  $\pm 60$  flowers. **Fruits achenes, obovoid, slight compressed, apex with strong and long beak, strangled at bottom, 5 perigonal bristles longer than the achene, with thornlets turned backwards, 1.9-2.3 x 0.9-1.2 mm. Surface faint longitudinal lineate, slight lustrous, yellowish-brown.**  $2n = 16$ . Native to Europe, swamps, river and pond banks. Sk, Uk.

**4229. *Eleocharis carniolica* W. D. J. Koch, *Scirpus carniolica* (W. D. J. Koch) Neilr.** — Perennial, densely tufted, stems filiformly thin, 10-20 cm, fine striate, sheaths pale-brown. **Fruits achenes, obovoid, slight flattish, apex with beak, stylopodium on bottom distinct strangled, perigonal bristles as long as the achene, with backward turned thornlets, 1.2-1.5 x 0.7-0.8 mm. Surface faint longitudinal striate, lustrous, pale-brown.**  $2n = 20$ . Native to Europe, meadow swamps, springheads and riverbanks. Hu, Pl, Ro, Sk, Uk.

**4230. *Eleocharis mamillata* H. Lindb., *E. palustris* subsp. *mamillata* (H. Lindb.) Beauverd** — Perennial, stems soft, fragile, tufted, non-sturdy. **Fruits achenes,  $\pm$  spherical, slight compressed, apex stylopodium wider than longer, strangled at bottom, perigonal white bristles longer than the achene with backward turned thornlets, 1.6-1.8 x 1-1.2 mm. Surface faint longitudinal lineate, lustrous, yellow to yellowish-brown.**  $2n = 16$ . Native to Eurasia, peatbogs, swamps and boundaries. Br, Hu, Pl, Ro, Sk.

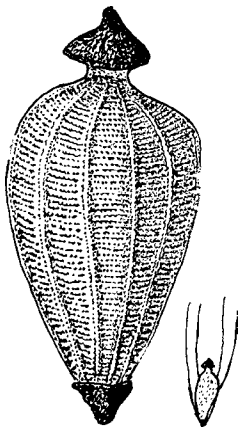
**4231. *Eleocharis multicaulis* (Sm.) Desv., *Scirpus multicaulis* Sm.** — Perennial, densely caespitose, with slender stems, up to 30 cm high, base of stems and leaf-sheaths straw-coloured or pale-brown. **Fruits achenes, ellipsoid, apex with long beak, bottom with 4-6 bristles, longer than the achene, 1.8-2.3 x 0.7-0.9 mm. Surface longitudinal lineate, lustrous, dark-brown.**  $2n = 20$ . Native to Europe, peatbogs and wet, sandy heaths, calcifuge. Pl, Uk.

**4232. *Eleocharis ovata* (Roth.) Roem. et Schult., *Scirpus ovatus* Roth** — Annual, densely tufted, stems numerous,  $\pm$  erect, 5-35 cm high, lower sheaths reddish-brown, upper green. **Fruits achenes, spherical with long beak, slight compressed, perigonal bristles (4-7) with backward turned thornlets, 1.8-2.2 x 0.9-1.1 mm. Surface faint longitudinal lineate, lustrous, yellow or pale-purple.**  $2n = 10$ . Native to Eurasia and North America, denuded bottoms of ponds and rivers, water-ditch banks. Br, Pl, Ro, Sk, Uk.

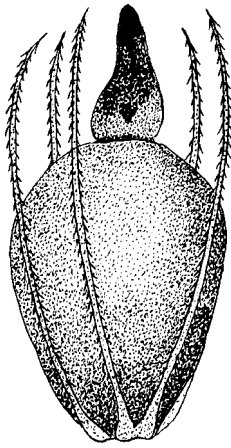
**4233. *Eleocharis palustris* (L.) Roem. et Schult., *Scirpus palustris* L.** — Perennial, stems numerous, 10-60 cm high, erect, oval, feeble. **Fruits achenes, obovoid or  $\pm$  spherical, slight compressed, apex with huge beak, perigonal bristles (0-4) with backward turned thornlets, 1.9-2.1 x 0.9-1.1 mm. Surface faint longitudinal lineate, slight lustrous, pale or dark-brown.**  $2n = 16$ . Native to Eurasia, wet meadows, muddy banks, fenlands and peatbogs. Hu, Mo, Pl, Ro, Sk, Uk.

**4234. *Eleocharis quinqueflora* (Hartmann) O. Schwarz, *Scirpus pauciflorus* Lightf.** — Perennial, tufted, stems up to 30 cm high, rigid. **Fruits achenes, obovoid, trigonous, dorsal side rooflike, convex, ventral side  $\pm$  flattish, apex with beak, perigonal bristles (4-6) as long as the achene and with backward turned thornlets, 2.5-2.9 x 1.3-1.5 mm. Surface fine longitudinal lineate, slight lustrous, greyish.**  $2n = 132, 134, 136$ . Native to Eurasia and North America, meadows, peatbogs, fenlands, moist sandbanks. Hu, Ro, Sk, Uk.

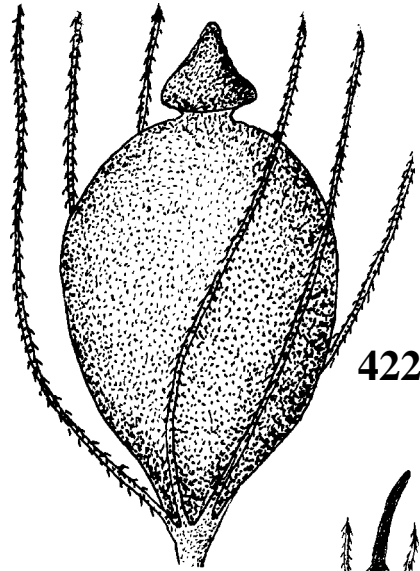
**4235. *Eleocharis uniglumis* (Link) Schult., *E. palustris* subsp. *uniglumis* (Link) C. Hartm., *Scirpus uniglumis* Link** — Perennial, stems up to 60 cm high, firm but slender, smooth, often shiny, spikelet with 10-30 florets. **Fruits achenes, obovoid with huge beak, with 0-5 bristles, rare much longer than the achene, 1.9-2.3 x 1.1-1.3 mm. Surface longitudinal fine lineate, lustrous, reddish- to blackish-brown.**



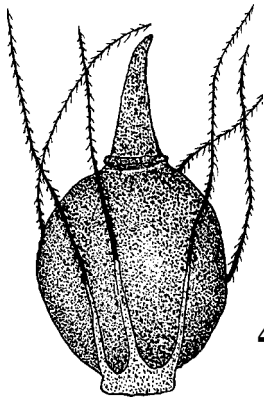
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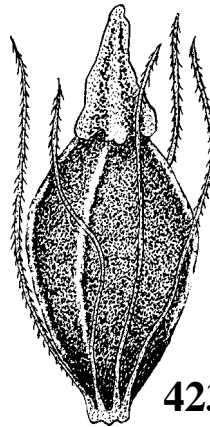
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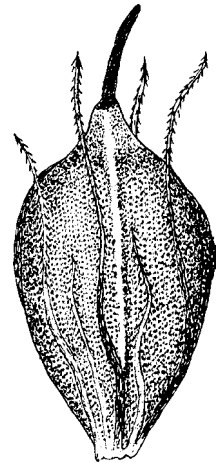
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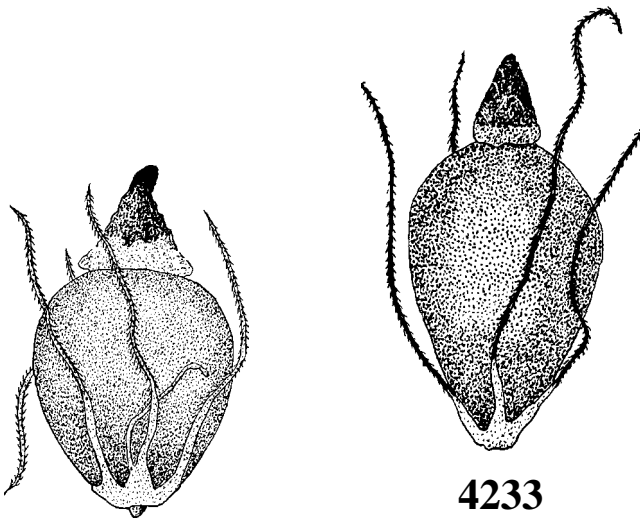
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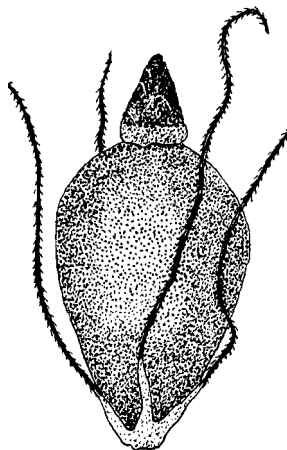
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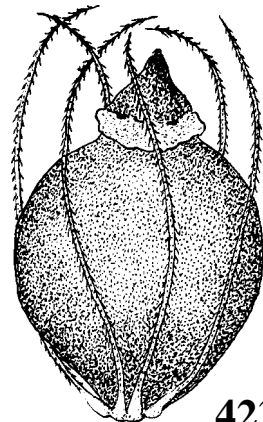
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4230

**2n = 46-(40-44, 54-92).** Native to circumpolar territories, saline or base-rich marshes. Hu, Mo, Pl, Ro, Sk, Uk.

**4236. *Isolepis setacea* (L.) R. Br., *Scirpus setaceus* L.** — Annual to perennial, densely tufted, stems thin, erect, 3-30 cm high, reddish-brown sheaths at base. **Fruits achenes, obovoid, slight compressed, blunt 3-angular, 0.8-0.9 x c. 0.6 mm.** Surface longitudinal ribbed and faint transversal runget, lustrous, blackish-brown. **2n = 26, 28.** Native to Eurasia, wet sandbanks, swampy pastures, saline meadows, boundaries, denuded banks. Hu, Pl, Ro, Sk.

**4237. *Schoenoplectus americanus* (Pers.) Volkart, *Scirpus americanus* Pers.** — Perennial, stems 30-60 cm high, single, thin, 3-angular, leaves up to 40 cm long, 1-3 mm wide, inflorescences from 2-6 ovoid spikelets. **Fruits achenes, obovoid, lateral compressed, 2.6-3 x 1.8-2 mm.** Surface very fine longitudinal-lineate, faint lustrous, brown to dark-brown. **2n = 76, 80, 100-128.** Native to Eurasia, moorlands, wet meadows and riverbanks. Hu, Pl, Uk.

**4238. *Schoenoplectus lacustris* (L.) Palla, *Scirpus lacustris* L.** — Perennial, deeply green, stems rough, oval, 50-300 cm, ramified above. **Fruits achenes, obovoid, 3-angular, slight flattish, apex with beak, perigonal bristles as long as the achene, with backward turned thornlets, 2.8-3.2 x 1.7-1.9 mm.** Surface fine longitudinal lineate, lustrous, greyish-brown. **2n = 42.** Native to Euro-Siberia, shallow, stagnant or slow-flowing waters, especially sandy banks; throughout the Carpathians.

**4239. *Schoenoplectus mucronatus* (L.) Palla, *Scirpus mucronatus* L.** — Perennial, densely tufted, 40-100 cm high, striate, 3-angular. **Fruits achenes, broad obovoid, blunt trigonous, apex with beak, bristles (4-6) longer than the achene, thornlets turned backwards, 1.8-2.3 x 1.4-1.6 mm.** Surface transversal humpy, lustrous, brown to blackish-brown. **2n = 42.** Native to Eurasia, overgrown swamps, pond banks, boundaries and reeds. Hu, Pl, Ro, Sk, Uk.

**4240. *Schoenoplectus supinus* (L.) Palla, *Isolepis supina* (L.) R. Br., *Scirpus supinus* L.** — Annual, densely tufted, stems erect, 3-30 cm high, often procumbent in muddy soils. **Fruits achenes, obovoid or spherical, apex with beak, 1.3-1.6 x 1-1.2 mm.** Surface protrudent transversal wrinkly, lustrous, brown or blackish-brown. **2n = 28.** Native to

Eurasia, muddy and denuded banks of ponds, wet fallows. Hu, Mo, Pl, Ro, Sk, Uk.

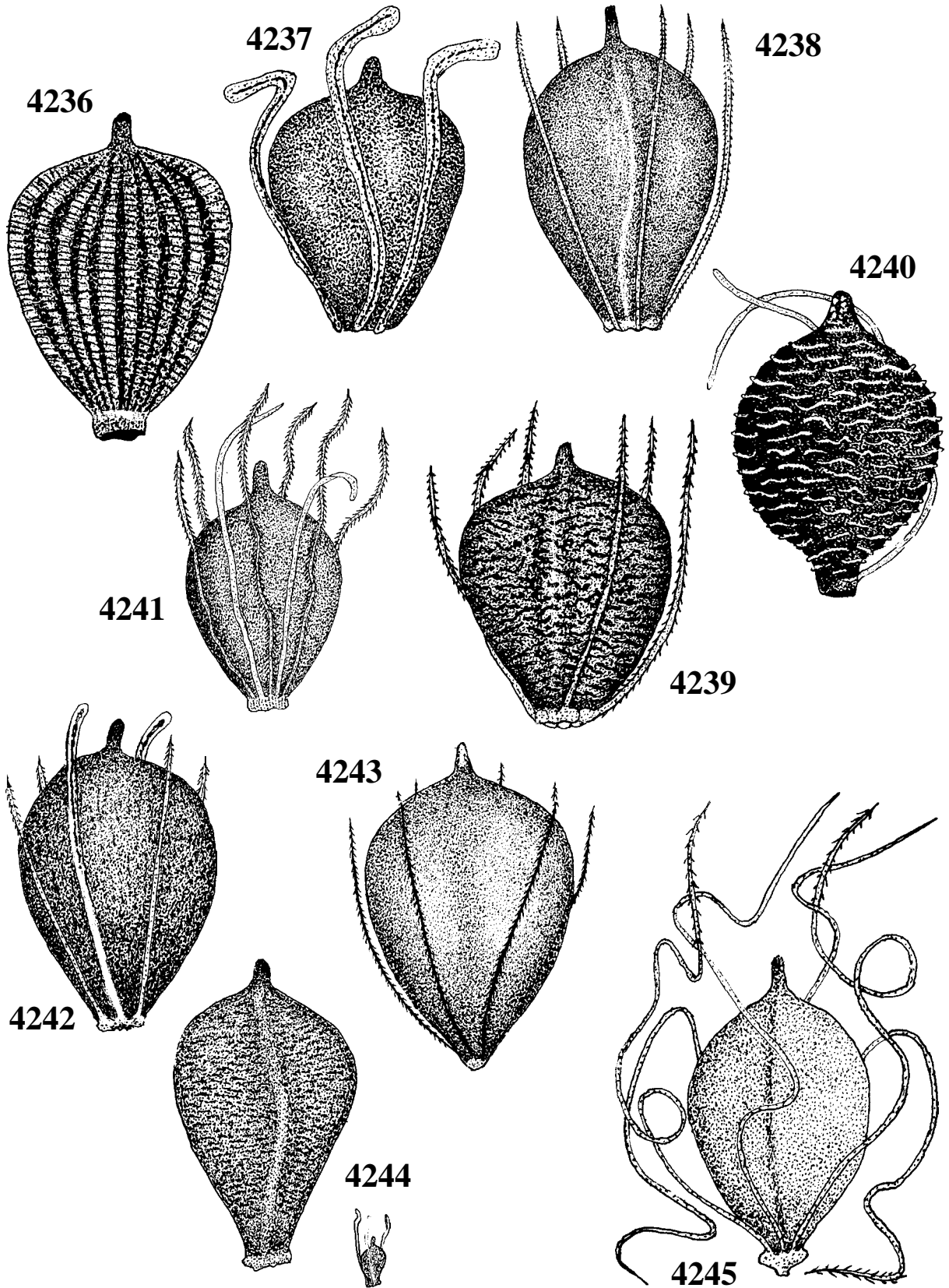
**4241. *Schoenoplectus tabernaemontani* (C. C. Gmel.) Palla, *Scirpus tabernaemontani* C. C. Gmel.** — Perennial, stems up to 150 cm high, grey or greyish-green, pale-brown below. **Fruits achenes, obovoid, plano- or biconvex, slight flattish, apex with beak, bristles longer than the achene, thornlets turned backward, 2.4-2.8 x 1.4-1.6 mm.** Surface very faint longitudinal striate, lustrous, greyish-brown. **2n = 42.** Native to Eurasia, reed banks of still waters, boundaries, wet saline grounds and meadow swamps. Hu, Mo, Pl, Ro, Sk, Uk.

**4242. *Schoenoplectus triquetet* (L.) Palla, *Scirpus triquetet* L.** — Perennial, non-tufted, deeply green, stems single, rigid, erect, rough, 50-150 cm high, sharply 3-angular. **Fruits achenes, obovoid, blunt 3-angular, dorsal side roundish, ventral flat, bristles as long as the achene, thornlets turned backwards, 2.3-2.7 x 1.6-1.8 mm.** Surface very longitudinal lineate, glabrous, high lustrous, yellowish or reddish-brown. **2n = 40, 42.** Native to Eurasia, on muddy banks or larger rivers and ditches, boundaries. Hu, Mo, Pl, Ro, Sk, Uk.

**4243. *Bolboschoenus maritimus* (L.) Palla, *Scirpus maritimus* L.** — Perennial, stems single, 3-angular, leafy, 30-120 cm high, scabrous above. **Fruits achenes, obovoid, blunt 3-angular or lenslike, bristles ± as long as the achene, thornlets turned backwards, apex with beak, 2.7-3.3 x 1.8-2.2 mm.** Surface granulate, lustrous, pale- or dark-brown. **2n = 76, 77, 86, 88, 104, 110.** Native to Eurasia and North America, reeds, pond and shallow stagnant-water banks, pond stripped bottoms; in whole Carpathians.

**4244. *Scirpoides holoschoenus* (L.) Soják, *Scirpus holoschoenus* L., *Holoschoenus vulgaris* Link** — Perennial, densely tufted, stems simple, erect, 30-150 cm high, roundish, grey-green. **Fruits achenes, obovoid, trigonous, dorsal side rooflike, ventral flat, apex with beak, perigonal bristles absent, 0.9-1 x 0.5-0.6 mm.** Surface transversal wrinkly, lustrous, dark-grey. **2n = c. 164.** Native to Eurasia, moist sandbanks, boundaries, rare on still-water banks and fenland meadows. Hu, Pl, Ro, Sk, Uk.

**4245. *Scirpus radicans* Schkuhr** — Perennial, densely tufted, stems sharply 3-angular, 40-90 cm high, inflorescence rich. **Fruits achenes, ellipsoid or obovoid,**



3-angular, dorsal side rooflike with longitudinal rib, ventral flattish, apex with beak, bristles (6) winding, 3 with backward turned thornlets at the ends and 3 without thornlets, 0.9-1 x 0.5-0.6 mm. Surface faint granulate, lustreless, yellowish-white.  $2n = 56, 58$ . Native to Eurasia, reeds, banks of larger rivers, water ditches and ponds, denuded bottoms of ponds. Br, Hu, Pl, Ro, Sk, Uk.

**4246. *Scirpus sylvaticus* L.** – Perennial, stems erect, 30-120 cm high, single, bluntly 3-angular, hollow. Fruits achenes, obovoid or ellipsoid, 3-angular or 3-sided, dorsal side rooflike with longitudinal rib, ventral flattish, apex with beak (stylopodium), bristles (6) as long as or a little longer than the achene, thornlets turned backwards, 1-1.2 x 0.6-0.7 mm. Surface faint longitudinal lineate, slight lustrous, yellowish-white.  $2n = 62-64$ . Native to Eurasia, wet meadows, lowland woods, muddy banks of still waters, boundaries, fenlands; throughout the Carpathians.

**4247. *Blysmus compressus* (L.) Panz. ex Link, *Schoenus compressus* L.** – Perennial, stems erect, 5-40 cm high, single or tufted, roundish, 3-angular above, rough, sheathy and leafy only below. Fruits achenes, ellipsoid or obovoid, 3-angular, apex with stylopodium (beak) longer than the achene, bristles 3-6, at least 2x as long as the achene, thornlets turned backwards, 1.5-2 x 0.9-1.1 mm. Surface fine longitudinal lineate, lustreless, pale-grey.  $2n = 44$ . Native to Eurasia, fen meadows, moist pastures, springheads and saline grounds; in all Carpathian territories.

**4248. *Blysmus rufus* (Huds.) Link** – Perennial, very similar to *B. compressus*. Fruits achenes, ellipsoid or ovoid, beak 1/4 of the achene, perigonal bristles absent or only one and short, 3.8-4.3 x 1.4-1.8 mm. Surface smooth, usually with a number of irregular depressions, lustrous, yellowish-brown.  $2n = 40$ . Native to Euro-Siberia, in saline soils only. Pl.

**4249. *Elyna myosuroides* (Vill.) Fritsch, *Kobresia myosuroides* (Vill.) Fiori** – Perennial, densely tufted, stems erect, 5-30 cm high,  $\pm$  oval, leafy below, basal sheaths brown, lustrous. Fruits achenes, ellipsoid, 3-angular, apex with beak (stylopodium), dorsal side rooflike, roundish, ventral flattish, 2.4-3 x 1-1.2 mm. Surface faint longitudinal lineate, slight lustrous, dark-brown.  $2n = 60$  (52-66). Native to Eurasia and North America, overgrown (grassy) calcite rocks. Pl, Ro, Sk.

**4250. *Kobresia simpliciuscula* (Wahlenb.) Mack., *K. caricina* Willd.** – Perennial, densely tufted, stems erect, 3-20 cm high, obtuse 3-angular,  $\pm$  rough, leafy only at base. Fruits achenes, spindle-shaped, gradually narrowed at both ends, 2.8-3.2 x 0.9-1.1 mm. Surface faint longitudinal lineate, lustreless, pale-brown.  $2n = 76$  (70-75). Native to Eurasia and North America, rock slots, grassy and stony meadows, on moist, humous, calcareous and flint-sandy stands. Pl, Ro, Sk.

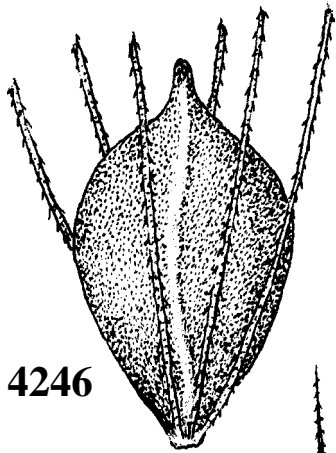
**4251. *Carex acuta* L., *C. gracilis* Curtis, *C. proluxa* Fries** – Perennial, stems 30-120 cm high, rigid, 3-angular, scabrous. Fruits achenes (left), spherical, lateral flattish, apex with short beak, veinous, faint longitudinal lineate, 2.6-3.2 x 1.4-1.6 mm. Surface lustreless, greenish-brown. Seeds (right) spherical or obovoid, apex with short beak, dorsal and ventral side convex, 1.6-1.8 x 1-1.2 mm. Surface smooth, pale-brown.  $2n = (74) 84$ . Native to Eurasia, depressed marshy and moor grounds. Br, Mo, Ro, Sk, Uk.

**4252. *Carex acutiformis* Ehrh., *C. paludosa* Gooden.** – Perennial, untufted, stems erect, 50-150 cm high, sharply 3-angular, scabrous. Fruits achenes (left), ovoid, flattish, veinous, apex short beaked, lustreless, short-stalked, 3.5-4 x 1.7-2 mm. Surface brown. Seeds (right) compressed, ellipsoid, trigonous, dorsal side with longitudinal rib, rooflike, ventral flat, with short beak, 1.8-2.1 x 1-1.2 mm. Surface lustreless, greyish-brown.  $2n = 38, 78$ . Native to Eurasia, swampy meadows, reeds, brook and pondbanks, peat and loamy grounds; in all Carpathian regions.

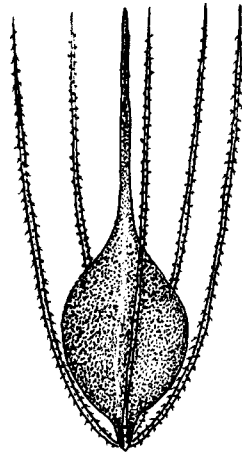
**4253. *Carex alba* Scop.** – Perennial, scarcely tufted, erect, 10-40 cm high, glabrous,  $\pm$  scabrous above, bluntly 3-angular. Fruits achenes (left), furrowed, obovoid with short beak, 3.2-3.7 x 1.8-2.1 mm. Surface lustrous, dark-brown. Seeds (right) obovoid, triangular in transversal section, dorsal side rooflike with longitudinal rib, ventral flat, apex with beak, 2.4-2.7 x 1.3-1.5 mm.  $2n = 54$ . Native to Euro-Siberia, light oak, beech, fir and pine forests, shrubby and stony slopes. Hu, Pl, Ro, Sk, Uk.

**4254. *Carex appropinquata* Schum., *C. paradoxa* Willd. non J. F. Gmel.** – Perennial, densely tufted, stems 30-80 cm high, erect, thin, sharply 3-angular, scabrous. Fruits achenes, slight flattish, obcordate, apex gradually narrowed, faint dentated, 2.4-3 x 1.5-1.7 mm. Seeds ovoid, apex with rest of the style,

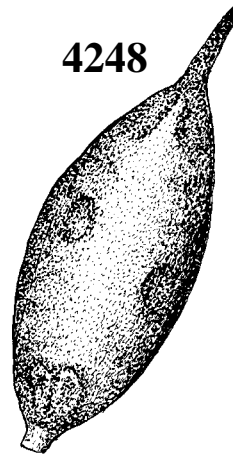




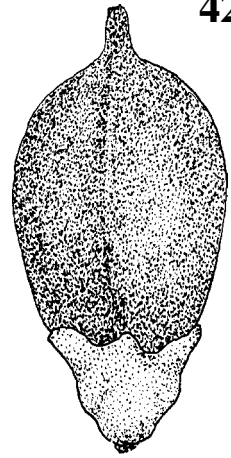
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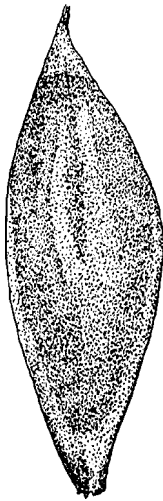
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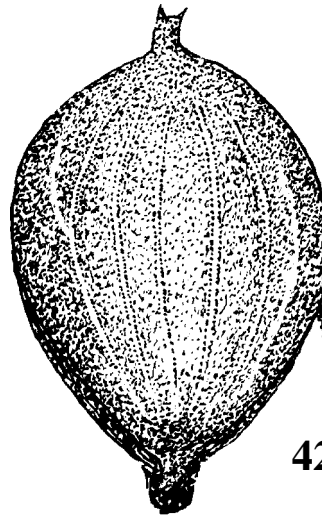
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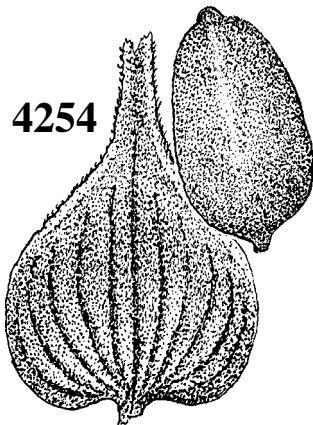
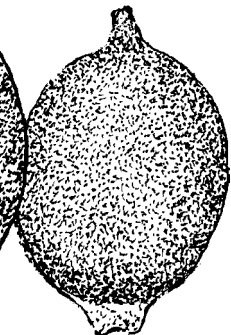
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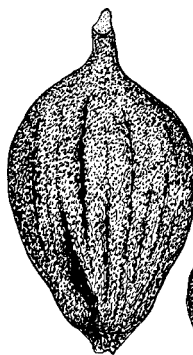
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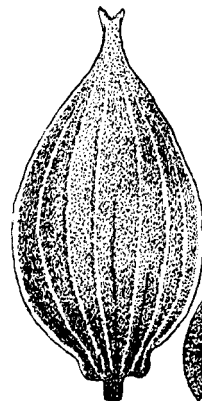
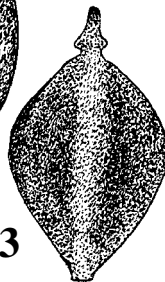
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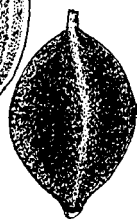
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**1.9-2.2 x 1-1.2 mm. Surface smooth, lustrous, pale to dark-brown.  $2n = 64$ .** Native to Eurasia, fenland and peat meadows, reeds, banks of still waters, spring-heads. Br, Hu, Pl, Ro, Sk, Uk.

**4255. *Carex aquatilis*** Wahlenb. — Perennial, stems 60-140 cm high, flatly 3-angular, smooth above by crooking fragile. **Fruits achenes, flattish, ellipsoid, veinless, or faint venous, 2.8-3.4 x 1.7-2 mm. Surface waved, lustreless, brown, whitish, sometimes one part brown, the other whitish. Seeds obovoid, compressed, apex with beak, lustrous, 1.7-1.9 x 1-1.2 mm. Surface dark-brown.  $2n = 64, 84$ .** Native to Eurasia and North America, banks of water ditches, dead water arms and peatbog brooks. Br.

**4256. *Carex arenaria*** Brandza, *C. ligerica* J. Gay — Perennial, stems 15-75 cm high, bluntly 3-angular, leafy, scabrous above. **Fruits achenes, ovoid, flat winged, 4.4-5 x 2-2.5 mm. Surface lustreless, yellowish-brown. Seeds ovoid or cylindric, compressed, long-beaked, 1.7-2 x 1.1-1.3 mm. Surface smooth, lustrous, brown.** Native to Europe, maritime, continental, mobile sandbanks and other sandy stands. Pl.

**4257. *Carex aterrima*** Hoppe, *C. sudetica* Opiz — Perennial, stems 30-80 cm high, strong, sharply angular, glabrous, lower inflorescence scabrous. **Fruits achenes, ellipsoid, flattish, apex with short beak, 3.8-4.2 x 2.1-2.3 mm. Surface veinless, lustreless, blackish-violet. Seeds ellipsoid or obovoid, with indistinct longitudinal rib, dorsal side rooflike, ventral flat, 2.1-2.3 x 1.7-1.9 mm. Surface lustreless, blackish-violet.** Native to central Europe, in juniper slopes of subalpine and alpine zones. Ro, Sk.

**4258. *Carex atherodes*** Spreng., *C. aristata* R. Br. non Honckeney — Perennial, stems 60-120 cm high, lower half leafy, sheaths below purple, richly hairy. **Fruits achenes, prolonged-obovoid, apex gradually narrowed, bottom convex, 5.7-6.3 x 2.1-2.3 mm. Surface multiribbed. Seeds obovoid, transversal section triangular, dorsal side rooflike, ventral flat, 2.5-2.7 x 1.1-1.3 mm. Surface lustreless, greyish-brown.** Native to eastern Europe, rare on banks of marshes, moorlands and other wet areas. Pl, Uk.

**4259. *Carex atrata*** L. — Perennial, densely tufted, stems erect, 10-60 cm high, stiff, sharply 3-angular, apex  $\pm$  pedulous. **Fruits achenes, ellipsoid, flattish, veinless, lustreless, very faint longitudinal striate,**

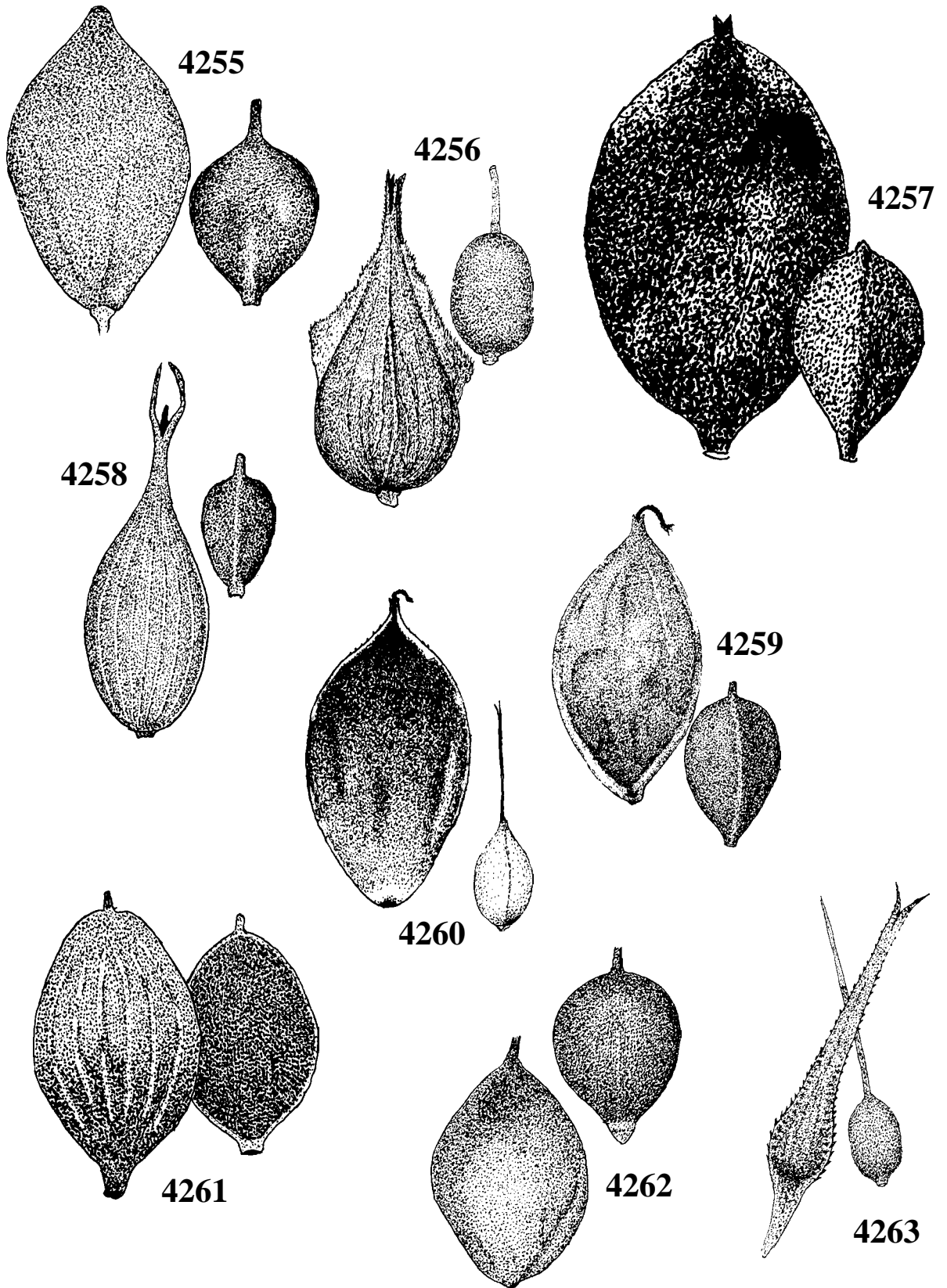
**3-3.6 x 1.5-1.8 mm. Surface dark up to black-brown. Seeds obovoid, apex with short beak, dorsal side rooflike with longitudinal rib, ventral flat, 1.7-1.9 x 1-1.2 mm. Surface slight lustrous.  $2n = 48, 52, 54, 56$ .** Native to Eurasia and North America, alpine meadows and pastures. Pl, Ro, Sk, Uk.

**4260. *Carex atrofusca*** Schkuhr, *C. ustulata* Wahlenb. — Perennial, scarcely tufted, stems erect, 10-40 cm high, rough, 3-angular, smooth, pedulous above. **Fruits achenes, flattish, obovoid or ellipsoid, apex scarce dentated, with short beak, 3.5-4 x 1.7-2 mm. Surface lustreless, veinless, smooth, dark- to blackish-violet, brim more or less whitish. Seeds fusiform, with long beak on apex, dorsal side rooflike, with longitudinal rib, ventral flat, 1.2-1.4 x 0.6-0.7 mm. Surface lustreless, yellowish-white.  $2n = 40$ .** Native to Eurasia, alpine meadows and glacial kettles. Pl, Ro, Sk.

**4261. *Carex bicolor*** Bell. — Perennial, stems 5-20 cm high, glabrous, lower inflorescence scabrous, erect, peak bended. **Fruits achenes (left), ovoid, ellipsoid or obovoid, slight venous, lateral sides slight convex, 2.3-2.6 x 1.2-1.4 mm. Surface lustreless, upper half whitish, lower half pale-reddish. Seeds (right) ovoid, lateral sides slight convex, edges pale-yellowish, apex with short beak, 1.7-2 x 1.1-1.2 mm. Surface lustreless, blackish-brown.  $2n = 16, 48, 50, 52$ .** Native to higher mountains of Europe, moist sandy-gravelly stands. Pl, Ro, Uk.

**4262. *Carex bigelowii*** Torr. ex Schwein., *C. dacica* Heuff. — Perennial, greyish-green, non-tufted, stems stiff erect, 10-30 cm high, sharply 3-angular, glabrous, or faint scabrous above. **Fruits achenes, ellipsoid, apex with short beak, 2.5-3 x 1.5-1.8 mm. Surface veinless, smooth, pale- to reddish-brown. Seeds  $\pm$  obovoid or spherical, apex with short beak, dorsal and ventral sides slight convex, 2-2.4 x 1.3-1.5 mm.  $2n = 70$  (68).** Native to Euro-Siberia, moist, grassy and stony or peaty alpine meadows on acid grounds. Ro, Sk, Uk.

**4263. *Carex bohemica*** Schreb., *C. cyperoides* Murray — Perennial, tufted, stems 10-60 cm high, obtuse, 3-angular, thin, glabrous, leafy below. **Fruits achenes, lanceolate, indistinct venous, with narrow dentate winged hem, 8-10 x 1-1.2 mm. Seeds cylindric, lateral compressed, beak longer than the seed, dorsal and ventral sides convex, 1.3-1.5 x 0.6-0.7 mm. Surface lustrous, pale-brown.  $2n = 80$ .** Native to Eurasia, denuded pond bottoms,



wet sandbanks, banks of water ditches and ponds, drying up boundaries. Hu, Pl, Ro, Sk, Uk.

**4264. *Carex brachystachys*** Schrank, *C. tenuis* Host — Perennial, densely tufted, stems thin, 10-30 cm high, feeble, bluntly 3-angular, glabrous. **Fruits achenes (left), broad lanceolate, gradually narrowed into long glabrous beak, 3.2-4 x 0.9-1.1 mm. Surface bare, multiveinuous. Seeds (right) ellipsoid, triangular in transversal section, dorsal side rooflike, ventral flattish, 2.1-2.3 x 0.7-0.9 mm. Surface lustreless, greyish or dark-brown. 2n = 40.** Native to Europe, rock slits, mostly on calcareous substrates. Pl, Ro, Sk.

**4265. *Carex brevicollis*** DC., *C. rhynchocarpa* Heuff. — Perennial, densely tufted, stems erect, 30-60 cm high, stiff, flat 3-angular, faint scabrous above. **Fruits achenes, obovoid or oval, flattish, apex with short beak, 6-7 x 1.8-2 mm. Surface lower half multivein, upper half smooth. Seeds ovoid or ellipsoid, slight 3-angular, compressed, 3.5-3.8 x 1.6-1.8 mm. Surface pale-brown. 2n = 54.** Native to Eurasia, light, leafy woods and shrubby, stony, calcareous slopes. Hu, Mo, Ro, Sk, Uk.

**4266. *Carex brizoides*** L., *Vignea brizoides* (L.) Rchb. — Perennial, stems erect, 30-70 cm high, feeble, procumbent later on, sabrious above, sheaths pale reddish-brown. **Fruits achenes, ovoid lanceolate, multiveinuous, dorsal side convex, ventral flattish, gradually narrowed into beak, 3.5-4.5 x 1.1-1.2 mm. Surface longitudinal lineate, greenish-brown. Seeds ovoid, dorsal side slight rooflike, ventral flat, apex with short beak, 1.9-2.1 x 0.8-0.9 mm. Surface lustreless, pale-brown. 2n = 58.** Native to Europe, moist woods and brookbanks, rare in moist meadows of the montane zone. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4267. *Carex brunnescens*** (Pers.) Poir., *C. persoonii* Sieber — Perennial, tufted, stems erect, 10-30 cm high, very thin, stiff, trigonous, scabrous above. **Fruits achenes, ovoid, flattish, multiveinuous, dorsal side convex, ventral flat, upper 1/3 minute toothed, apex with short beak and lateral slit, 1.8-2.6 x 1-1.2 mm. Surface grayish. Seeds oval, dorsal side slight convex, ventral flat, 1.3-1.5 x 0.9-1 mm. Surface lustrous, brown.** Native to Eurasia and North America, mountain peatbogs, wet pastures, non-calcareous grounds, subalpine and alpine zones. Br, Pl, Ro, Sk.

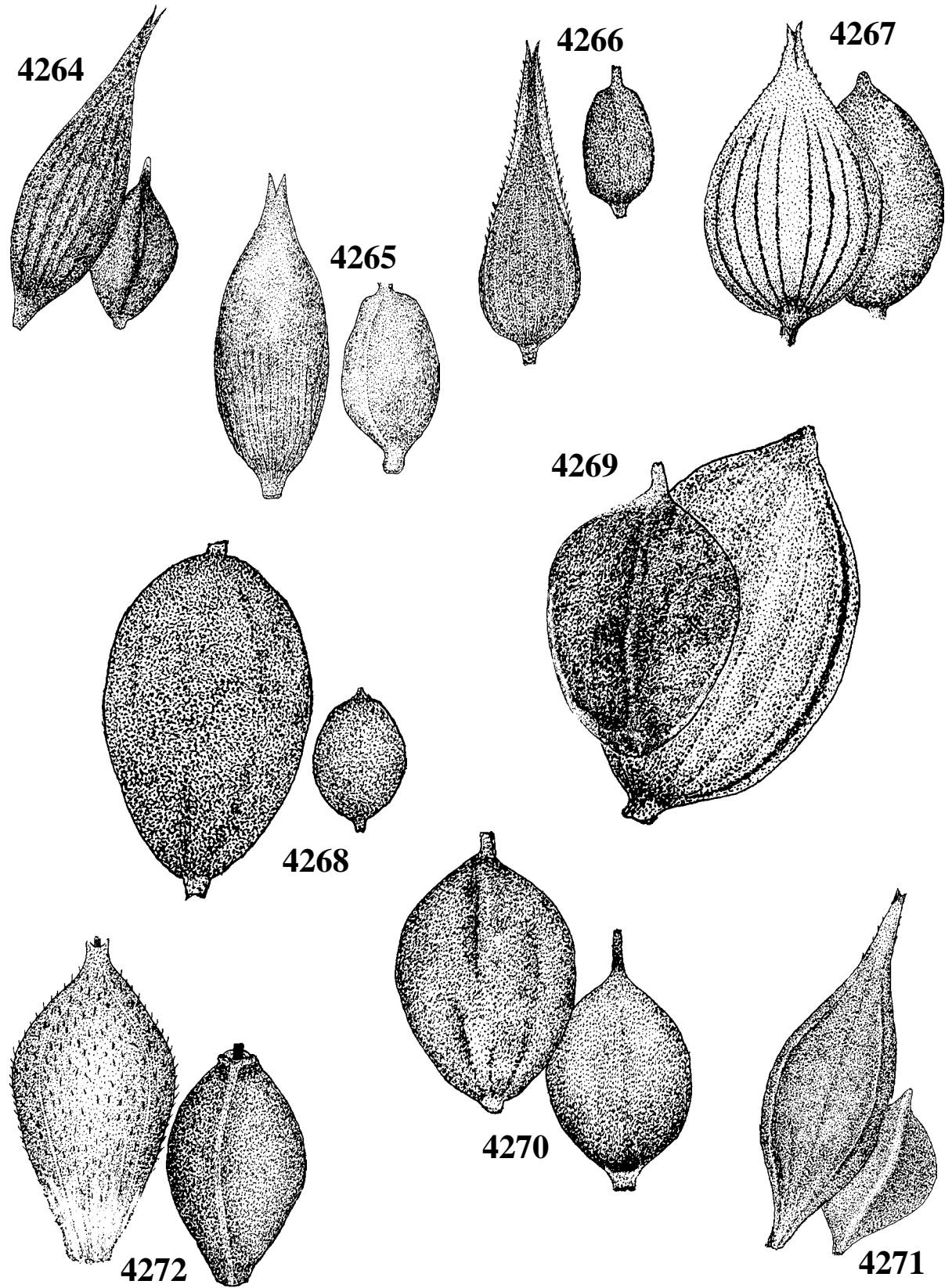
**4268. *Carex buekii*** Wimmer, *C. banatica* Heuff. — Perennial, stems erect, 40-120 cm high, 3-angular, coarse above, stem leaves short, basal leaves longer than the stem. **Fruits achenes, ellipsoid, lateral compressed, without veins, 2-2.2 x 1.2-1.4 mm. Surface smooth, yellowish-brown. Seeds ± roundish, lateral compressed, apex with small beak, 0.7-0.8 x 0.5-0.6 mm. Surface glabrous, slight lustrous, yellowish-brown. 2n = 40.** Native to Europe, valley saline meadows, small river and brook shrubby banks. Hu, Pl, Ro, Sk, Uk.

**4269. *Carex buxbaumii*** Wahlenb. — Perennial, loosely tufted, stems erect, 15-80 cm high, sharply 3-angular, ± pendulous above. **Fruits achenes, ellipsoid, flattish, beakless, 3-4 x 1.8-2 mm. Surface indistinct multiveinuous, greenish-white. Seeds obovoid, triangular in transversal section, dorsal side rooflike, ventral flat, apex with short beak, 2-2.3 x 1.4-1.5 mm. Surface lustreless, greyish-brown. 2n = 74.** Native to Eurasia and North America, on wet fen meadows, pond banks, marshy stands of subalpine and alpine zones. Br, Pl, Ro, Sk, Uk.

**4270. *Carex caespitosa*** L. — Perennial, very densely tufted, stems erect, 30-80 cm high, slender, sharply 3-angular, poorly leafed at base. **Fruits achenes, broad to globular ellipsoid, veinless or broad veinous, but very indistinct, apex with short beak, 2-2.5 x 1.3-1.5 mm. Surface lustreless, pale-brown. Seeds ± spherical, strong flattish, with indistinct rib, apex with beak, 1.7-1.9 x 1.1-1.3 mm. Surface faint longitudinal lineate, lustreless, brown. 2n = 78, 80.** Native to Eurasia, wet meadows, fenlands, often in lowland alluvial soils of larger rivers. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4271. *Carex capillaris*** L. — Perennial, densely tufted, stems erect, 5-50 cm high, very thin. **Fruits achenes (left), ovoid-ellipsoid veinless, apex and bottom gradually narrowed into beak, 3.3-3.6 x 1-1.3 mm. Surface lustrous, greyish-brown. Seeds (right) ellipsoid, triangular in transversal section, dorsal side rooflike, ventral flat, apex with short beak, 1.5-1.8 x 1-1.2 mm. Surface glabrous, slight lustrous, dark-brown. 2n = 54.** Native to Eurasia and North America, high mountain meadows, basic to slightly acid soils. Pl, Ro, Sk, Uk.

**4272. *Carex caryophyllea*** Latourr., *C. verna* Chaix non Lam., *C. praecox* Jacq. non Schreb. — Perennial,



sparsely tufted, stems erect or bent, 5-30 cm high, bluntly 3-angular, scabrous only above. **Fruits achenes, obovoid, apex narrowed into short beak, 2.2-3 x 1.1-1.3 mm. Surface scarce downy, veinless or only in lower part, lustreless, greenish-brown. Seeds ellipsoid, dorsal side convex, with longitudinal ribs, ventral flat with collarlet and rest of the style at apex, 1.6-1.8 x 1.1 mm. Surface lustreless, dark-brown. 2n = 62, 64, 66, 68.** Native to Euro-Siberia, dry pastures and meadows, boundaries, grassy paths and slopes, forest clearings. Hu, Mo, Pl, Ro, Sk, Uk.

**4273. *Carex chordorrhiza* L. fil., *Vignea chordorrhiza* (L. fil.) Rchb.** — Perennial, stems 15-30 cm high, erect, procumbent later on, slightly 3-angular, glabrous, leafy at base. **Fruits achenes, ± spherical, lateral flattish, short beak with notch at apex, 3.5-4 x 1.9-2.1 mm. Surface multiveinous, glabrous, lustrous, partly yellowish, partly brown, up to dark-brown. Seeds ellipsoid or oval, slight compressed, apex with beak, 2-2.3 x 1.4-1.6 mm. Surface glabrous, lustrous. 2n = 60.** Native to circumpolar territories, overflowed peatbogs. Br, Pl, Ro, Sk, Uk.

**4274. *Carex colchica* J. Gay** — Perennial, stems 20-50 cm high, stems blunt 3-angular above, leaf sheath 2-3 mm in diam., loculus 4-4.5 mm, ovoidal, inflorescence with 3-6 spikelets. **Fruits achenes (right), ovoid, lateral compressed, dorsal side slight convex, ventral side flat, apex prolonged into beak, 4-4.4 x 2-2.4 mm. Surface longitudinal ribbed, dull, brown. Seeds (left) compressed, 2-2.4 x 1.1-1.3 mm. Surface brown.** Native to south-eastern Europe, sandy steppes, slopes and grassless stands. Mo, Uk.

**4275. *Carex curta* Good., *C. canescens* auct. non L.** — Perennial, caespitose, stems erect, 20-50 cm high, sharply trigonous, scabrid above. **Fruits achenes, ovate to ovate-elliptic, planoconvex, beak scabry, 2.3-2.8 x 1-1.2 mm. Surface prominent veinous. Seeds oval, lateral compressed, apex beaked, 1.3-1.5 x 0.8-0.9 mm. Surface fine waved, lustreless, pale-brown. 2n = (52, 54), 56.** Native to northern and central Europe, wet, usually base-poor habitats; in all Carpathian territories.

**4276. *Carex curvula* subsp. *rosae* Gilomen** — Perennial, densely caespitose, stems 5-40 cm high, erect, glabrous, leaves shorter than stems, 1-1.5 mm wide, basal sheaths pale-brown. **Fruits**

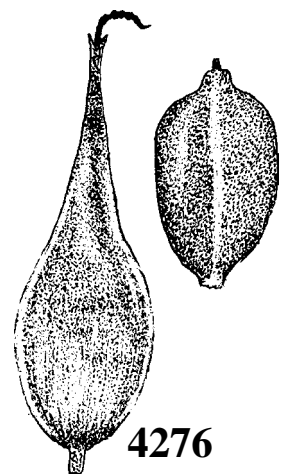
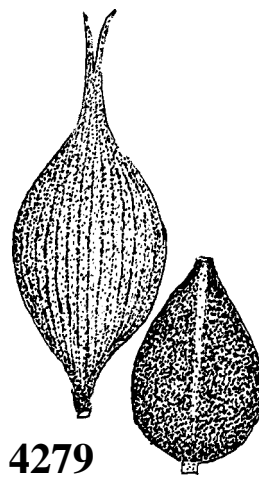
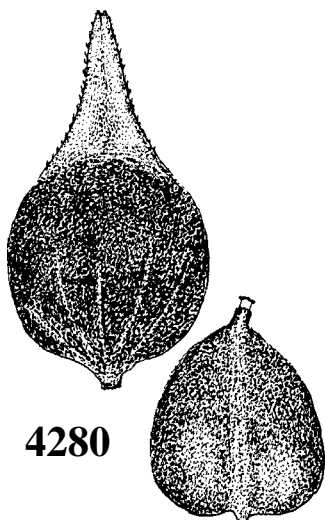
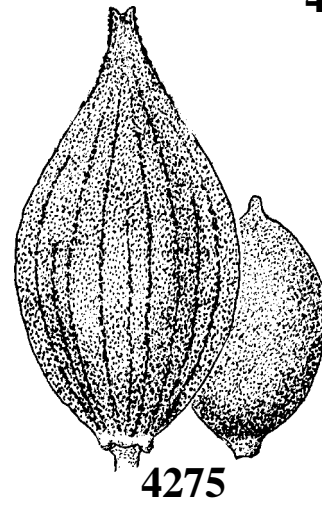
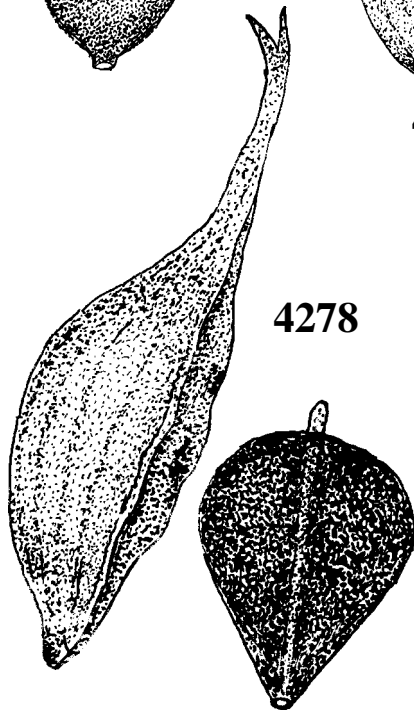
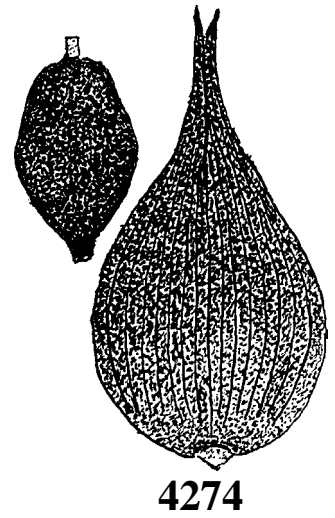
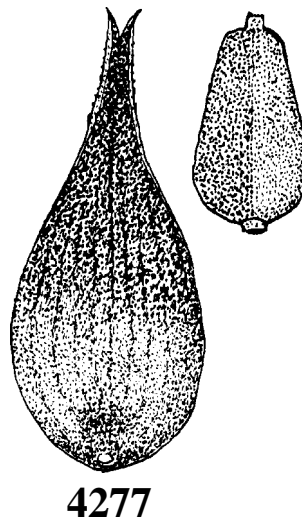
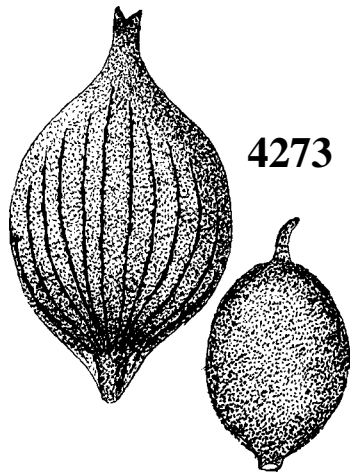
**achenes, lanceolate, trigonous, 2-winged, gradually narrowed into long beak, 5-8 x 1.5-2 mm. Surface indistinct-veinous or veinless. Seeds ovoid, trigonous in transversal section, dorsal side black with pale longitudinal blunt rib, 2.8-3.2 x 1.5-1.8 mm. Surface lustreless, greyish-brown. 2n = 86.** Native to southern and southcentral Europe, high-mountain meadows and overgrown rocks, calcicole. Pl, Ro, Uk.

**4277. *Carex davalliana* Sm., *Vignea davalliana* (Sm.) Rchb.** — Perennial, densely tufted, stems numerous, erect, stiff, 10-40 cm high, thin, scabrous above. **Fruits achenes, lanceolate, flattish, upper part gradually narrowed into beak, 3.7-4.3 x 1.4-1.6 mm. Surface thin-multiveinous, glabrous, slight lustrous, reddish-brown. Seeds ± ovoid, compressed, 3-angular, upper part with short beak, 1.8-2 x 0.9-1.1 mm. Surface smooth, slight lustrous, yellowish-green or brown. 2n = 46.** Native to Europe, fen-meadows. Br, Hu, Pl, Ro, Sk, Uk.

**4278. *Carex demissa* Hornem, *C. tumidicarpa* Anderss.** — Perennial, stems 5-20 cm high, ascendent, peak crooked down. **Fruits achenes, symmetric, broad ellipsoid, dorsal side convex, ventral flat, abrupt narrowed into long beak, 3.4-3.8 x 1.8-1.9 mm. Surface veinous, colliculate, yellow or greenish-yellow. Seeds obovoid, 3-angular, apex with beak, bottom gradually narrowed, 1.2-1.3 x 1-1.1 mm. Surface lustreless, dark-brown. 2n = 70.** Native to Europe, wet meadows and pastures, spring-heads. Sk.

**4279. *Carex depauperata* Good., *C. ventricosa* Curt.** — Perennial, laxly caespitose, stems 30-70 cm high, erect, bluntly 3-angular, glabrous, leafy. **Fruits achenes, ellipsoid, with slender beak above and long leglet below, 7-8 x 2.5-3 mm. Surface multiveinous, lustrous, greenish-brown. Seeds obovoid, 3-angular, gradually narrowed toward bottom, 4-4.5 x 2.4-2.6 mm. Surface foveolate, slight lustrous, brown. 2n = 44.** Native to Eurasia, dryer woods, shady shrubberies of lowland and upland zones. Ro, Uk.

**4280. *Carex diandra* Schrank, *C. teretiuscula* Gooden.** — Perennial, scarcely tufted, stems 20-60 cm high, slender, roundish, rough above. **Fruits achenes, ± spherical, slight lateral flattish, lower part veinous, apex gradually narrowed into dentate beak, 2.4-3 x 1.2-1.4 mm. Surface longitudinal lineate, lustrous, dark-brown. Seeds obcordate,**



dorsal side with rib, rooflike, ventral flat, 1.6-1.8 x 1.1-1.2 mm. Surface dull, dark-brown.  $2n = 60$ . Native to circumpolar territories, peatbogs and fenland meadows, wet and muddy grounds. Br, Hu, Pl, Ro, Sk, Uk.

**4281. *Carex digitata*** L. — Perennial, tufted, stems ascending and erect, 10-30 cm high, leafless, flat-3-angular, glabrous, faint scabrous above. **Fruits achenes, obovate, blunt 3-angular, broad stalked, abrupt narrowed into beak at apex, 3.4-4.2 x 1.2-1.4 mm. Surface veinless, with 2 lateral ribs, downy, yellowish-brown. Seeds elliptic, 3-angular, apex with short beak, bottom with whitish leglet,  $\pm$  as long as the corpus, 2.5-2.9 x 1.1-1.3 mm. Surface faint downy, slight lustrous, greenish.  $2n = 48, 50, 52, 54$ . Native to Eurasia, in shady leafy woods, shrubby slopes; in all Carpathians.**

**4282. *Carex diluta*** Bieb., *C. karelinii* Meinsh. — Perennial, stem 20-50 cm high, leaves green or yellowish-green. **Fruits achenes, ovate, upper part gradually narrowed into wider beak, 3-3.5 x 1.4-1.6 mm. Surface distinct veinous. Seeds oblong ovoid, with gradually narrowed lower part, apex with small beak, 1.9-2.2 x 0.9-1.1 mm. Native to southcentral and eastern Europe, saline meadows and streamsides. Ro, Uk.**

**4283. *Carex dioica*** L., *Vignea dioica* (L.) Rchb. — Perennial, non-tufted, stems stiffly, erect, 5-40 cm high, short-ascendent, obtusely 3-angular, glabrous, rough under spike. **Fruits achenes, broad ovate, compressed, apex gradually narrowed into dentate beak, 2.8-3.5 x 1.6-1.8 mm. Surface multiveinous, pale- and dark-brown. Seeds ellipsoid, compressed, transversal section discoidal, 1.4-1.6 x 0.9-1.1 mm. Surface faint lustrous, yellowish-green.  $2n = 52, 60$ . Native to Euro-Siberia and North America, peatbogs, fen- and peat-meadows. Br, Pl, Ro, Sk, Uk.**

**4284. *Carex distans*** L., *C. pseudoflora* Schur — Perennial, densely tufted, stems erect, 20-60 cm high, bluntly 3-angular, glabrous. **Fruits achenes, obovate or ellipsoid, flattish, apex narrowed into beak, 3.5-4.5 x 1.4-1.7 mm. Surface multiveinous, glabrous, yellowish-green, spotted reddish. Seeds obovate, 3-angular, with short beak, 1.8-2.2 x 1.2-1.4 mm. Surface glabrous, lustreless, pale-brown.  $2n = 72, 74$ . Native to Europe, wet meadows and pastures, boundaries, fenlands, springheads. Hu, Pl, Ro, Sk, Uk.**

**4285. *Carex disticha*** Huds., *C. intermedia* Gooden. — Perennial, stems erect, 30-80 cm high, slender, 3-angular, scabrous above. **Fruits achenes, ovate, flattish, upper part gradually narrowed into beak, circumference dentate, 4-5 x 1.5-2 mm. Surface multiveinous. Seeds oval or ovate, discoidal in transversal section, apex with long beak, 1.8-2.2 x 1-1.2 mm. Surface slight lustrous, dark-brown.  $2n = 62$ . Native to Euro-Siberia, fen- and swamp-meadows, river and brookbanks. Hu, Pl, Ro, Sk, Uk.**

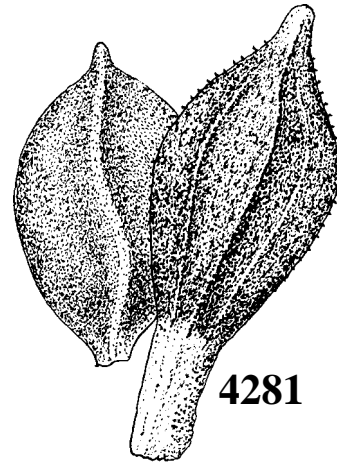
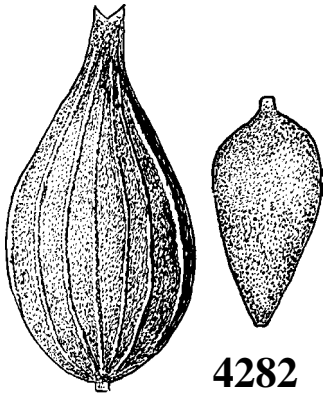
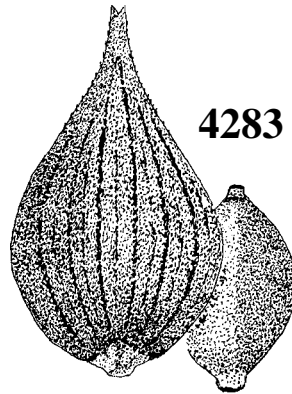
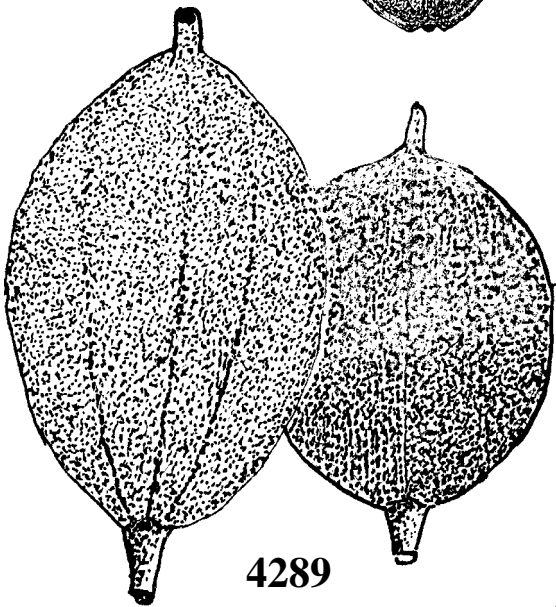
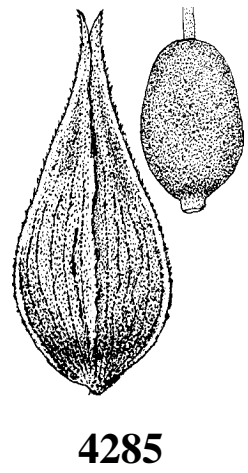
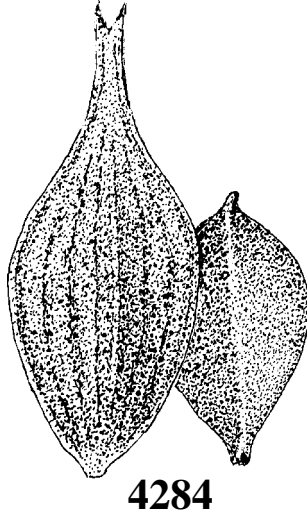
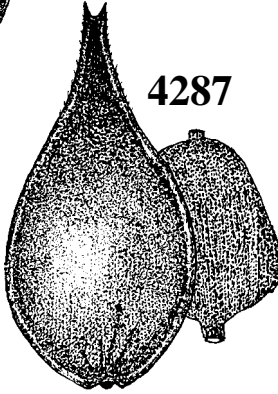
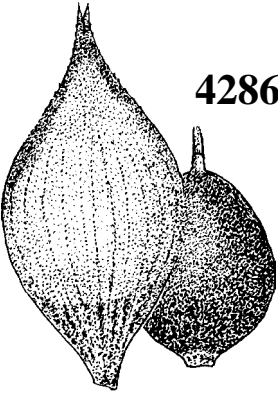
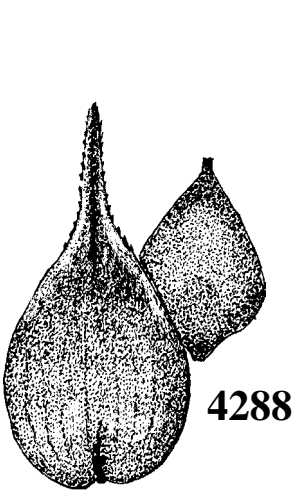
**4286. *Carex divisa*** Huds., *Vignea divisa* (Huds.) Rchb. — Perennial, grey-green, stems erect, 10-50 cm high, 3-angular, faint scabrous above. **Fruits achenes (left), broad ovate, smooth, dorsal side convex, ventral flat, upper part gradually narrowed into scarce dentate beak, 3.3-4 x 1.6-1.8 mm. Surface multiveinous, lustrous, whitish to dark-brown. Seeds (right) ovate or elliptic, compressed, transversal section discoidal, apex with short beak, 2-2.2 x 1.4-1.5 mm. Surface lustrous, pale- to dark-brown.  $2n = 62$ . Native to Eurasia, sandy and grassy places, meadows, pastures, saline grounds. Hu, Mo, Ro, Sk, Uk.**

**4287. *Carex divulsa*** Stokes, *Vignea divulsa* (Stokes) Rchb. — Perennial, tufted, stems at base coated with pale-brown, later on blackish sheaths, 20-100 cm high, trigonous, scabrous above. **Fruits achenes, ellipsoid-ovate, bottom of dorsal side faint veinous, convex, ventral side flat and smooth, apex with beak, 4.3-5 x 2-2.4 mm. Surface lustrous, yellowish-brown. Seeds ovoid with short beak, compressed, 2.5-2.8 x 1.7-1.9 mm. Surface lustrous, brown.  $2n = 58$ . Native to Europe, light woods and groves, shrubberies. Hu, Mo, Pl, Ro, Sk, Uk.**

**4288. *Carex echinata*** Murray, *C. stellulata* Gooden. — Perennial, tufted, stems erect, 15-40 cm high, thin-3-angular, glabrous or scabrous only above. **Fruits achenes, ovate, smooth, dorsal side convex, ventral flat, apex gradually narrowed into dentate beak, 2.8-3.5 x 1.4-1.6 mm. Surface indistinct veinous, slight lustrous, greenish to dark-brown. Seeds obovate or conic, compressed, discoidal in transversal section, 1.6-1.8 x 1-1.2 mm. Surface glabrous, slight lustrous, brown.  $2n = 56, 58$ . Native to circumpolar territories, peatbogs, swamp bogs, fen-meadows and pastures, springheads, calcifuge. Hu, Mo, Pl, Ro, Sk, Uk.**

**4289. *Carex elata*** All., *C. hudsonii* A. Benn. — Perennial, densely tufted, stems stiff, 50-120 cm





high, leafy, sharply striately 3-angular, scabrous. **Fruits achenes, ellipsoid, strong flattish, very faint veinous or veinless, apex with beak, 3.3-4 x 1.7-2 mm. Surface greenish-brown. Seeds elliptic, strong compressed, edges ribbed, apex with short beak, 2.1-2.3 x 1.6-1.8 mm. Surface lustreless, glabrous, brown. 2n = 74, 78, 80.** Native to Europe, fenlands, swamp and pondbanks. Br, Hu, Pl, Ro, Sk, Uk.

**4290. *Carex elongata* L., *Vignea elongata* (L.) Rchb.** — Perennial, stems erect, 30-80 cm high, feeble, 3-angular, considerably scabrous. **Fruits achenes, prolonged lanceolate, multiveinous, dorsal side convex, ventral flattish, upper part gradually narrowed into beak, 3.2-3.8 x 1.2-1.4 mm. Surface lustrous, glabrous, greyish-brown. Seeds ovate, compressed, transversal section semiellipsoid, dorsal side convex, ventral flat, with short beak, 1.7-2 x 1-1.2 mm. Surface waved, slight lustrous, brown. 2n = ± 50.** Native to Euro-Siberia, lowland woods, fen-meadows, pond and forest brookbanks. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4291. *Carex ericetorum* Pollich, *C. approximata* Bell. ex All.** — Perennial, scarcely tufted, stems ascendent up to erect, 5-30 cm high, slender, bluntly 3-angular, glabrous. **Fruits achenes, obovoid to ellipsoid, apex with very short beak, bottom with leglet, 2-2.5 x 1.2-1.4 mm. Surface veinless, downy, greyish-brown. Seeds spherical with beak at apex and broad leglet below, 1.6-1.8 x 0.9-1.1 mm. Surface glabrous, lustreless, dark-grey. 2n = 30.** Native to Euro-Siberia, sandy pine-woods and pastures, rocky slopes. Br, Hu, Pl, Ro, Sk, Uk.

**4292. *Carex extensa* Good., *C. nervosa* Desf., *C. balbisii* Ten.** — Perennial, stems 10-50 cm high, glabrous, bluntly 3-angular. **Fruits achenes, obovoid, flattish, blunt 3-angular, apex with short beak, 2.8-3.5 x 1.5-1.7 mm. Surface multiveinous, glabrous, coloured olive, punctate reddish. Seeds obovate, trigonous, 2-2.3 x 1.3-1.5 mm. Surface glabrous, lustreless, brown. 2n = 60.** Native to Eurasia and Africa, swampy, saline grounds, thriving mainly in littoral areas. Mo, Pl, Ro, Uk.

**4293. *Carex firma* Host, *C. rigida* Schrank** — Perennial, densely tufted, stems stiff, 5-20 cm high, ascendent, bluntly 3-angular, smooth. **Fruits achenes, prolonged lanceolate, trigonous, upper half of narrow ciliary wings, apex with beak, 4-4.6 x**

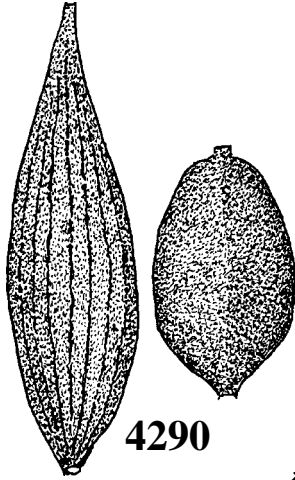
**1.1-1.3 mm. Surface tender veinous, greyish-brown. Seeds oval, 3-angular, apex with beak, 2.3-2.7 x 0.9-1.1 mm. Surface faint longitudinal lineate, lustreless, dark-brown. 2n = 34.** Native to Europe, high-mountain stony meadows and rocks. Pl, Ro (?), Sk.

**4294. *Carex flacca* Schreb., *C. glauca* Scop.** — Perennial, non-tufted, stems erect, 20-60 cm high, stiff, bluntly 3-angular, ± glabrous. **Fruits achenes, oval or ovoid, shallow 3-angular, rounded or with very short beak above, 3.3-3.7 x 1.4-1.7 mm. Surface veinless, papillate to short downy, lustreless, blackish-brown. Seeds obovate, 3-angular, bottom gradually narrowed, apex short-beaked, 2.2-2.6 x 1.1-1.3 mm. Surface under whitish reticulum dark-brown. 2n = 76.** Native to Europe, moist meadows, fenlands, springheads, moist forest edges and clearings. Hu, Pl, Ro, Sk, Uk.

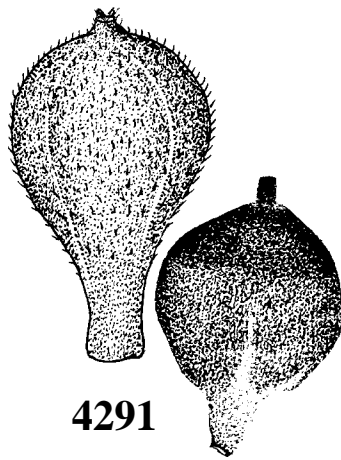
**4295. *Carex flava* L. subsp. *euflava* Aschers. et Graebn.** — Perennial, tufted, stems erect, 20-80 cm high, glabrous, yellowish-green. **Fruits achenes, broad ellipsoid, glabrous, curved, apex narrowed into 2 mm long beak, 4-6 x 1.5-1.8 mm. Surface distinct veinous, yellow. Seeds obovate, 3-angular, apex truncate, with short beak, bottom part gradually narrowed, 1.5-1.8 x 1-1.2 mm. Surface fine lineate, lustreless, dark-brown. 2n = 60 (58).** Native to Eurasia, wet and fen-meadows, springheads. Br, Hu, Pl, Ro, Sk, Uk.

**4296. *Carex fritschii* Waisb., *C. montana* subsp. *fritschii* (Waisb.) O. Schwarz** — Perennial, densely tufted, stems slender, 40-65 cm high, bluntly 3-angular, scabrous above. **Fruits achenes, obovate, apex with short beak, bottom gradually narrowed, 3.5-4 x 1.8-2 mm. Surface sparse veinous, lustreless, grey. Seeds irregular ovoid, transversal section spherical with 3 ribs, apex with short beak, 2.4-2.7 x 1.6-1.8 mm. Surface reticulate-foveate, lustreless, grayish. 2n = 30.** Native to Europe, light oak-woods. Hu, Sk.

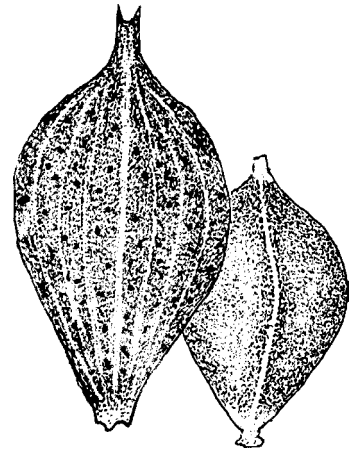
**4297. *Carex fuliginosa* Schkuhr, *C. misandra* R. Br.** — Perennial, densely tufted, bluntly 3-angular, faint scabrous, leafy. **Fruits achenes, lanceolate, shallow 3-angular, gradually narrowed into faint dentate beak above, 3.8-4.2 x 1.1-1.3 mm. Surface base veinless, one surface area whitish, the rest blackish-brown. Seeds obovate, 3-angular, apex with short beak, bottom gradually narrowed, 1.4-1.6 x 0.9-1.1 mm. Surface longitudinal faint**



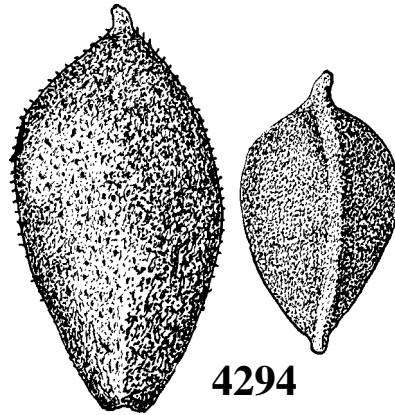
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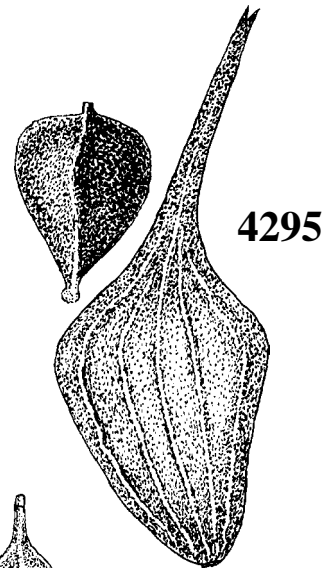
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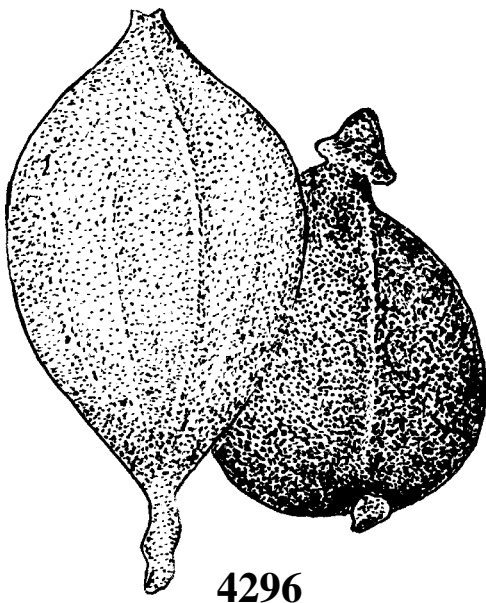
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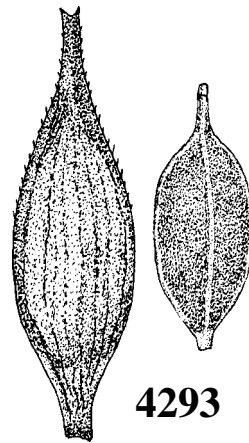
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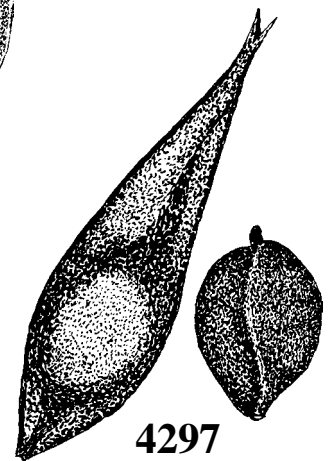
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4293



4297

striate, lustreless, greyish-brown.  $2n = 40$ . Native to Europe, moist and grassy mountain meadows, wet rocks. Pl, Ro, Sk, Uk.

**4298. *Carex globularis* L.** — Perennial, laxly caespitose, stems 20-50 cm high, scabrous above, basal sheaths reddish. **Fruits achenes, ovoid-trigonous, gradually contracted into short beak, 2.2-2.8 x 1.2-1.4 mm. Surface multiveinous. Seeds obovoid-trigonous, apex with beak, bottom gradually narrowed into hilum, 2-2.4 x 0.9-1.1 mm. Surface striate, lustrous, dark-grey.** Native to northern Europe, damp woods, peaty grounds, calcifuge to some extent. Br, Pl, Uk.

**4299. *Carex hallerana* Asso, *C. alpestris* All.** — Perennial, densely tufted, stems thin, erect, 10-40 cm high, bluntly 3-angular, scabrous above. **Fruits achenes, obovoid, 3-angular, abrupt narrowed into short beak, 3.7-4.3 x 1.7-2 mm. Surface distinct multiveinous, greenish-brown. Seeds obovate, 3-angular, apex with short beak, bottom gradually narrowed, 3.5-4 x 1.6-1.8 mm. Surface glabrous, lustreless, brown.  $2n = 50, 52, 54$ .** Native to Europe, sunny, grassy and shrubby slopes. Hu, Ro, Sk, Uk.

**4300. *Carex hartmanii* Cajander, *C. emasculata* V. Krecz.** — Perennial, freely tufted, stems erect, 20-80 cm high, 3-angular, inflorescence mostly pendulous. **Fruits achenes, oval, flattish, apex with short beak, 2.5-3.2 x 1.6-1.8 mm. Surface multiveinous, lustreless, greenish or pale-brown. Seeds ellipsoidal, trigonous, apex with short beak, 2-2.2 x 1.3-1.4 mm. Surface lustreless, greyish-brown.  $2n = 106$ .** Native to Eurasia, wet and fen-meadows, muddy pastures, pond margins. Br, Pl, Sk, Uk.

**4301. *Carex hirta* L.** — Perennial, non-tufted, stems erect, stiff, 15-100 cm high, bluntly 3-angular, glabrous, scabrous in inflorescence. **Fruits achenes, inflated ovoid, gradually narrowed into beak with deep notch, 5-7 x 2.2-2.8 mm. Surface multiveinous, downy, pale-brown. Seeds obovate, 3-angular, apex abrupt narrowed into beak, bottom gradually narrowed into hilum, 3.8-4.2 x 1.9-2.1 mm. Surface glabrous, lustreless, pale-brown.  $2n = 112$ .** Native to Europe, roads, banks, pastures, clearings; throughout the Carpathians.

**4302. *Carex hordeistichos* Vill., *C. hordeiformis* Wahlenb. non Host** — Perennial, densely tufted, stems erect, 10-50 cm high, bluntly 3-angular, glabrous. **Fruits achenes (left), ovoid-lanceolate, 3-angular,**

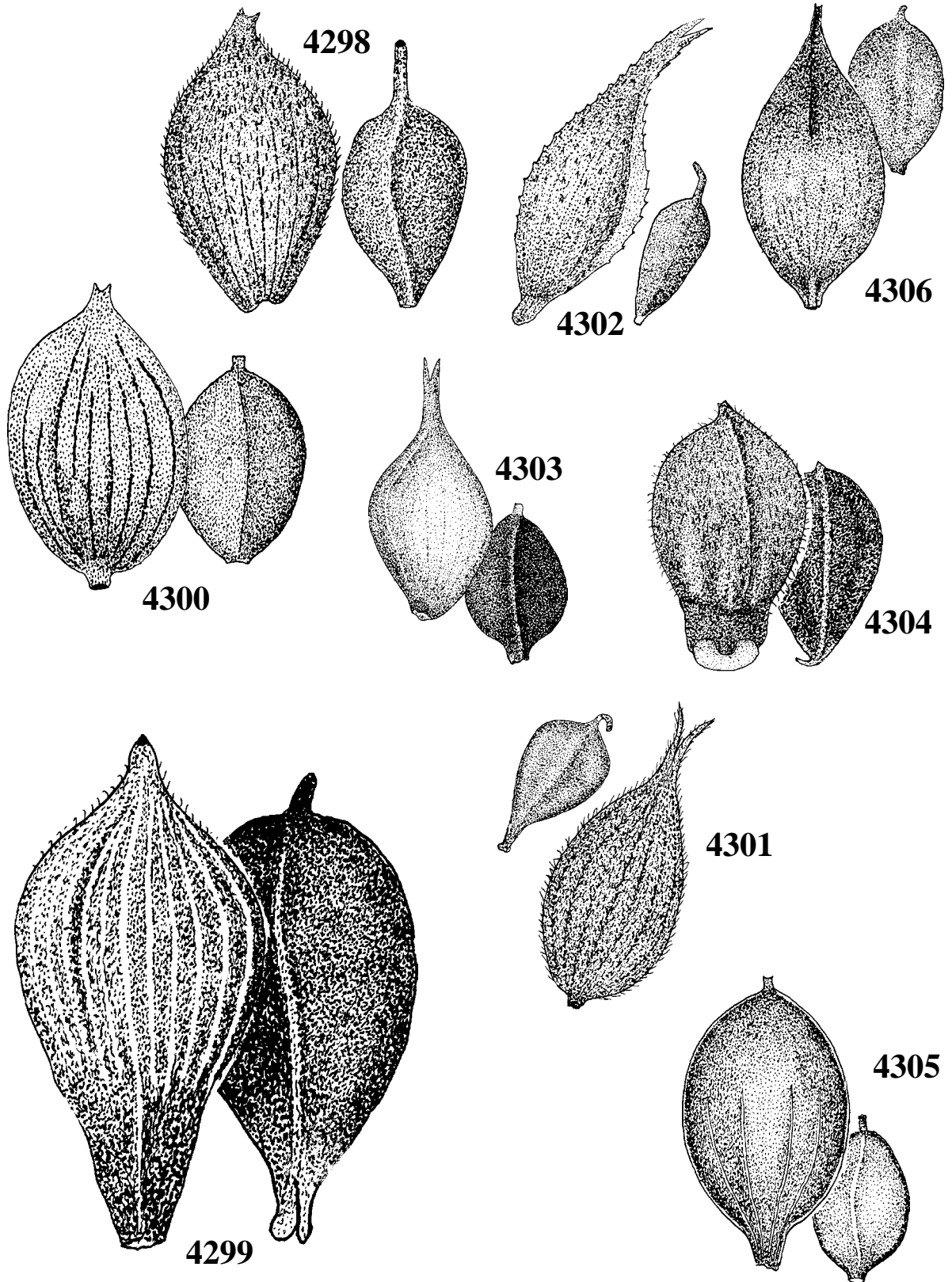
**serrate winged and gradually narrowed into beak, 8-10 x 2.8-3.4 mm. Surface faint venous, scarce downy, lustrous, yellowish-brown. Seeds (right) prolonged obovate with long beak, bottom gradually narrowed, 3.5-4 x 1.4-1.6 mm. Surface faint striate, slight lustrous, dark-brown.  $2n = 54-60$ .** Native to Europe, moist meadows, boundaries, wet pastures and roadsides. Hu, Mo, Pl, Ro, Sk, Uk.

**4303. *Carex hostiana* DC., *C. hornschiuchiana* Hoppe** — Perennial, scarcely tufted, 20-70 cm high, slender, bluntly 3-angular, faint scabrous above. **Fruits achenes, obovate, inflated, bluntly 3-angular, 2.6-3 x 1.2-1.4 mm. Surface multiveinous, lustreless, whitish-brown. Seeds ovate, 3-angular, apex with short beak, bottom gradually narrowed into hilum, 1.6-1.8 x 1-1.2 mm. Surface glabrous, lustreless, dark-brown.  $2n = 56$ .** Native to Europe, moist meadows, peatbogs, fenlands, springheads. Hu, Pl, Ro, Sk, Uk.

**4304. *Carex humilis* Leyss.** — Perennial, densely tufted, stems slender, 2-10 cm high, bluntly 3-angular, smooth. **Fruits achenes, prolonged obovate, blunt 3-angular, apex with short beak, 2.8-3.2 x 1.5-1.7 mm. Surface indistinct venous, downy, greenish-brown. Seeds obovate, without or with very short beak, 3-angular, 2.1-2.5 x 1.4-1.6 mm. Surface glabrous, lustreless, dark-brown.  $2n = 36$ .** Native to Eurasia, steppe hills, grassy steppe pastures, rocks and forest steppes. Au, Hu, Mo, Pl, Ro, Sk, Uk.

**4305. *Carex irrigua* (Wahlenb.) Sm. ex Hoppe, *C. magellanica* subsp. *irrigua* (Wahlenb.) Hiitonen** — Perennial, ascending, stem 10-50 cm high, leaves 2-4 mm, wide pale-green. **Fruits achenes, elliptic, with short beak at apex, 3.6-4.1 x 2-2.3 mm. Surface weak venous. Seeds elliptic-trigonous, with short beak at apex, 2-2.3 x 1.1-1.3 mm.  $2n = 58$ .** Native to circumpolar territories, peatbogs, wet mountain meadows. Br, Pl, Ro.

**4306. *Carex lachenalii* Schkuhr, *C. lagopina* Wahlenb., *C. bipartita* All.** — Perennial, scarcely tufted, stems erect or slightly ascendent, 10-20 cm high, slender  $\pm$  stiff, bluntly 3-angular, glabrous. **Fruits achenes, ovate, gradually narrowed into linear beak, 2.7-3 x 1.2-1.4 mm. Surface thin-venous, dark-brown above, yellowish-brown below. Seeds cylindric, trigonous, apex with beak, 1.5-1.7 x 0.8-1 mm. Surface glabrous, lustreless, pale-brown.  $2n = 62, 64$ .** Native to circumpolar territories, peatbogs and snow deck-chairs. Pl, Ro, Sk, Uk.



**4307. *Carex lasiocarpa*** Ehrh., *C. filiformis* Gooden. non L. — Perennial, grey-green, non-tufted, stems erect, 30-120 cm high, slender, bluntly 3-angular, glabrous, scabrous above. **Fruits achenes, ovate, apex gradually narrowed into beak, 3.5-4 x 1.8-2 mm. Surface of whole corpus dense hirsute, veinous, greyish-brown. Seeds obovate, 3-angular, 1.8-2.2 x 0.8-1 mm. Surface faint reticulate-foveate, lustreless, greyish-brown. 2n = 56.** Native to Eurasia and North America, peatbogs, heathery lands, swampy meadows, boundaries and pond sides; in all Carpathian territories.

**4308. *Carex lepidocarpa*** Tausch, *C. flava* L. subsp. *lepidocarpa* (Tausch) Godron — Perennial, tufted, stems 20-35 cm high, faint scabrous below inflorescence. **Fruits achenes, obovate-ellipsoid, abrupt narrowed into long beak, 3.3-4 x 1.5-1.8 mm. Surface veinous, yellow. Seeds obovate, 3-angular, apex ± truncate with short beak, 1.5-1.8 x 1-1.2 mm. Surface glabrous, lustreless, dark-brown. 2n = (58) 68.** Native to Europe, wet, fen-meadows and pastures, springheads. Hu, Pl, Ro, Sk, Uk.

**4309. *Carex ligerica*** Gay — Perennial, stems 20-50 cm high, usually with pale-brown basal sheaths, leaves shorter than stems, 1-2 mm wide. **Fruits achenes (right), inflated, ovoid, usually with slit and a narrower scarious wings in upper part, 4-4.5 x 2.1-2.4 mm. Surface distinct veinous. Seeds (left) ± ovoid-rhomboid, lateral compressed, slight trigonous, with small beak at apex, 1.8-2.1 x 1.1-1.3 mm. Surface granulate, lustrous, dark-brown. 2n = 58.** Native to Eurasia, dry and sandy areas. Pl, Ro.

**4310. *Carex limosa*** L. — Perennial, non-tufted, stems erect, 10-40 cm high, thin, single or some in tuft, faint scabrous above. **Fruits achenes, inflated, ellipsoid or ovoid, flattish, apex narrowed into short beak, 3.2-4.2 x 2-2.8 mm. Surface distinct veinous, edge narrow winged, lustreless, greyish-brown. Seeds cylindric, 3-angular, apex with long beak, 3.3-4 x 1.3-1.5 mm. Surface glabrous, lustreless, light-brown. 2n = 56, 62, 64.** Native to Euro-Siberia and North America, peatbogs, fenlands, poor and acid grounds. Br, Pl, Ro, Sk, Uk.

**4311. *Carex liparocarpos*** Gaudin, *C. nitida* Host — Perennial, scarcely tufted, stems 10-30 cm high, glabrous. **Fruits achenes, inflated, broad ovate or spherical, dorsal side distinct veinous, apex with obscure beak, 3.2-3.8 x 2-2.4 mm. Surface leathery,**

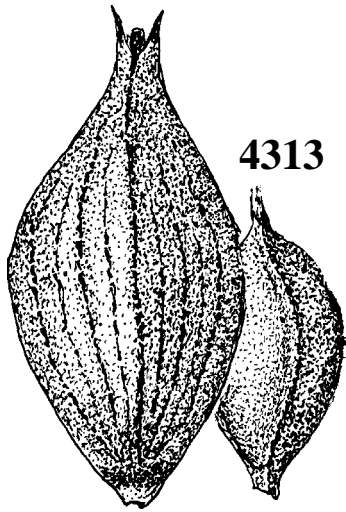
**lustrous. Seeds elliptic, 3-angular, 2.3-2.7 x 1.4-1.7 mm. Surface longitudinal faint striate, lustrous, brown, 2n = 36.** Native to Eurasia, steep slopes, light and dry pine-woods on sandy grounds. Hu, Ro, Sk, Uk.

**4312. *Carex magellanica*** Lam., *C. paupercula* Michx., *C. livida* Willd. — Perennial, stems erect, 10-30 cm high, slender, little inclined above, coarse, leaves as long as stems, 2-4 mm wide. **Fruits achenes, broad ovate, margin narrow hemmed, apex with or without small beak, 2.8-3.2 x 1.9-2.1 mm. Surface veinous only in lower part, smooth, greyish or bluish-brown. Seeds elliptic, 3-angular, apex with short beak, 8-2.2 x 1.1-1.3 mm. Surface brown. 2n = 58.** Native to circumpolar regions, peatbogs and peat-meadows, wet and acid stands. Br, Pl, Ro.

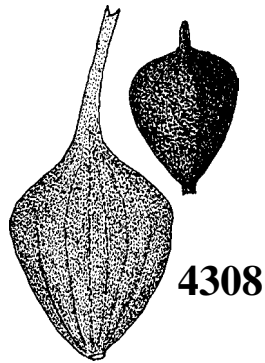
**4313. *Carex melanostachya*** M. Bieb. ex Willd., *C. nutans* Host — Perennial, stems erect, 30-100 cm high, slender, bluntly 3-angular, glabrous, scabrous above. **Fruits achenes, biconvex, obovate, beak short and broad, 4.5-5 x 2.2-2.4 mm. Surface depressed veinous, bare, greyish-brown. Seeds elliptic, 3-angular, dorsal side rooflike, ventral flat-tish, 2.4-2.6 x 1.2-1.4 mm. Surface glabrous, lustreless, greyish-brown.** Native to Eurasia, floodplains, alluvial meadows and fenlands. Hu, Mo, Ro, Sk, Uk.

**4314. *Carex michelii*** Host — Perennial, slightly tufted, stems ± erect, 15-45 cm high, bluntly 3-angular, slender, glabrous. **Fruits achenes (right), obovate, obtuse, 3-angular, gradually narrowed into beak, 6-7 x 2-2.5 mm. Surface indistinct multiveinous, smooth, greenish-brown. Seeds (left) obovate, 3-angular, beak short, bottom gradually narrowed, 3.4-3.8 x 2.1-2.3 mm. Surface reticulate-foveate, lustreless, greyish-brown. 2n = c. 70.** Native to Eurasia, light woods, dry grasslands and scrubs. Hu, Mo, Pl, Ro, Sk, Uk.

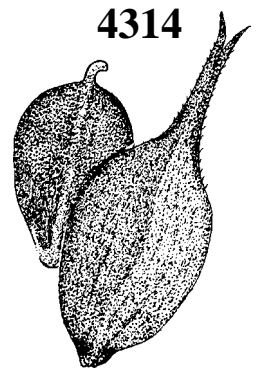
**4315. *Carex microglochin*** Wahlenb. — Perennial, ascending, stems 5-25 cm high, erect, slender, subterete, smooth, basal sheaths pale-brown, with basal leaves only. **Fruits achenes, elliptic-lanceolate, ventral side with 4 veins, apex with long beaks, 5-6 x 0.7-0.8 mm. Seeds conic-trigonous, ventral side with rib, apex with small beak, bottom truncate, 1.9-2.2 x 0.6-0.7 mm. Surface longitudinal lineate, lustreless, chocolate-brown. 2n = 48, 58.** Native to northern Europe, wet, base-rich habitats. Br, Pl.



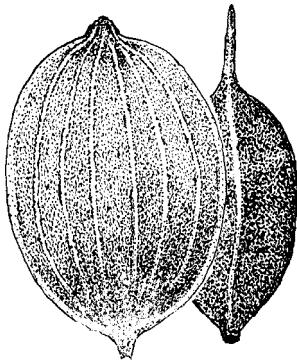
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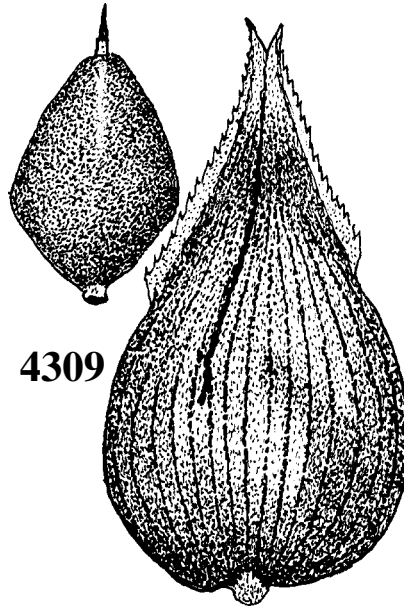
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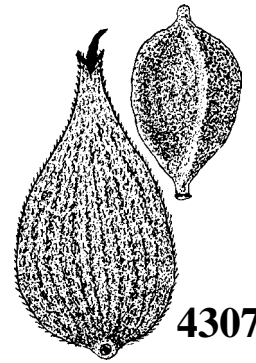
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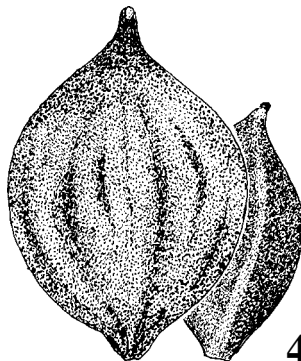
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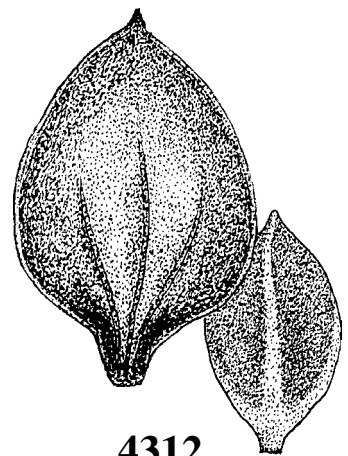
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**4316. *Carex montana* L., *C. coarctata* Kit. ex Heuff.** — Perennial, densely tufted, stems erect, 10-40 cm high, weak, bended later on, scabrous above. **Fruits achenes, biconvex, prolonged obovate, apex with a minute, emarginate beak, 3.4-4.2 x 1.7-2.1 mm. Surface fine veinous, short tomentose, greenish-brown. Seeds ovate, upper part gradually narrowed into short beak, 3-angular, bottom with leglet, 3-3.5 x 1.5-1.7 mm. 2n = 38.** Native to Eurasia, light woods, shrubberies and pastures. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4317. *Carex mucronata* All.** — Perennial, densely caespitose, stems 7-40 cm high, erect, nodding, filiform, obscurely trigonous, smooth, basal sheaths pinkish-brown. **Fruits achenes, convexo-concave or planoconvex, gradually narrowed toward apex, 4.7-5.3 x 2.3-2.7 mm. Surface indistinct veinous. Seeds ± ovate, biconvex, upper part truncate, 2.4-2.6 x 1.8-2 mm. Surface fine granulate, faint lustrous, brown. 2n = 34, 36.** Native to the Alps and mountains of northwestern Yugoslavia, dry and rocky places, calcicole. Ro (?).

**4318. *Carex muricata* L., *Vignea muricata* (L.) Rchb.** — Perennial, stems 20-100 cm high, tufted, 3-angular, scabrous above. **Fruits achenes, rounded at base, ovate, lateral compressed, dorsal side convex, ventral flat, prominent flanged at margin, 4.2-4.5 x 1.9-2.1 mm. Surface distinct veinous, smooth, greenish-brown. Seeds slight elliptic, compressed, elliptic in transversal section, beak very short, 2.4-2.6 x 1.6-1.7 mm. Surface glabrous, slight lustrous, chocolate-brown. 2n = 56, 58.** Native to Eurasia, forest margins, shrubberies and pastures; in all Carpathian regions.

**4319. *Carex nigra* (L.) Reichard, *C. vulgaris* Fries, *C. fusca* All.** — Perennial, non-tufted or turfy tufted, stems 10-60 cm high, sharply 3-angular, slender, scabrous above. **Fruits achenes (left), obovate or ellipsoid, lateral compressed, beak very short, faint wrinkly, 2.6-3 x 1.8-2 mm. Surface veinous, lustreless, salmon-coloured. Seeds (right) ovoid or spherical, beak very short, with rest of the stalk on bottom part, 1.7-2.4 x 1.1-1.3 mm. Surface minute reticulate-foveate, lustreless, brown. 2n = (82) 84.** Native to Eurasia, wet meadows and pastures, swamps, fenlands, peatbogs, banks of waters, boundaries; in all Carpathian regions.

**4320. *Carex oederi* Retz., *C. serotina* Mérat** — Perennial, tufted, stems 5-20 cm high, erect or ascen-

dant. **Fruits achenes, slight inflated, obovate, sharp narrowed into long beak, 2.4-2.9 x 0.9-1.1 mm. Surface thin-veinous, reticulate-foveate, lustreless, greenish-yellow. Seeds obovate, 1.4-1.6 x 0.7-0.8 mm. Surface glabrous, lustreless, dark-brown. 2n = (68), 70.** Native to Eurasia, pond sandbanks, rare in wet meadows, boundaries and peatbogs. Br, Hu, Pl, Ro, Sk, Uk.

**4321. *Carex ornithopoda* Willd., *C. pendata* L. (p. p.)** — Perennial, tufted, stems slender, ascendent, 5-15 cm high, smooth, faint scabrous only above. **Fruits achenes, obovate, blunt 3-angular, beak short, with long leglet, 3-3.6 x 1-1.2 mm. Surface veinless, smooth, tomentose, reddish-brown. Seeds obovate, 3-angular, beak short, bottom narrowed, 1.7-2.2 x 1-1.2 mm. Surface faint wrinkly, lustreless, chocolate-brown. 2n = 54.** Native to Europe, light leafy woods, forest meadows, rests of pine-forest areas, rocks and screes on calcareous grounds and sandstones. Pl, Ro, Sk, Uk.

**4322. *Carex otrubae* Podp., *C. nemorosa* auct. non Schrank, *Vignea otrubae* (Podp.) Soják** — Perennial, stems 3-angular, 30-90 cm high, roundish, tufted. **Fruits achenes (right), broad ovate, flattish, beak strong, long and notched, 4.5-5 x 2.5-2.7 mm. Surface longitudinal fine striate, marked multi-veinous at both sides, pale or dark-brown. Seeds (left) ovate, compressed, elliptic in transversal section, 2.3-2.5 x 1.5-1.7 mm. Surface wrinkly, slight lustrous, pale-terracotta. 2n = 58, 60.** Native to Europe, wet and muddy meadows, overgrown banks of still waters, saline muddy pastures. Hu, Mo, Pl, Ro, Sk, Uk.

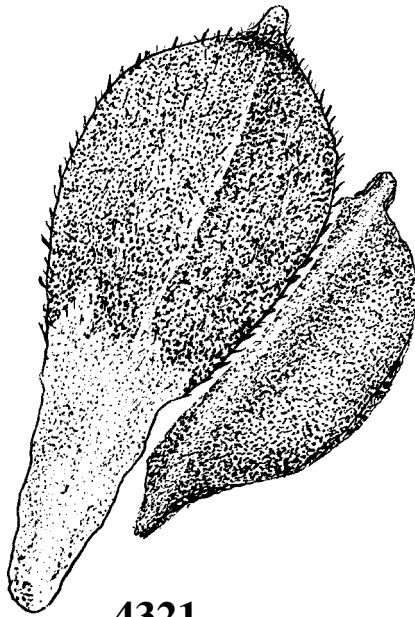
**4323. *Carex ovalis* Good., *C. leporina* auct. non L.** — Perennial, tufted, stems erect, 20-60 cm high, stiff, 3-angular, scabrous above, leafy below. **Fruits achenes, ovoid-elliptic, upper part dentate, winged around, 3.8-4.5 x 1.8-2 mm. Surface distinct veinous, pale-brown. Seeds ± ovate, transversal section elliptic, with long beak at apex, 1.6-1.7 x 0.9-1.1 mm. Surface glabrous, lustrous, pale- or dark-brown. 2n = 64, 66, 68.** Native to Europe, northern Africa and North America, moist sandbanks, light forests of montane and subalpine zones. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4324. *Carex pairaei* F. W. Schultz, *C. muricata* subsp. *pairaei* (F. W. Schultz) Čelak.** — Perennial, densely tufted, stems erect, 50-80 cm high, bluntly angular. **Fruits achenes, ovate, both**

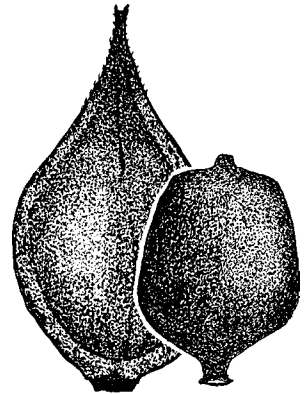




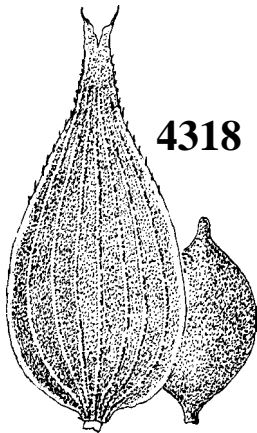
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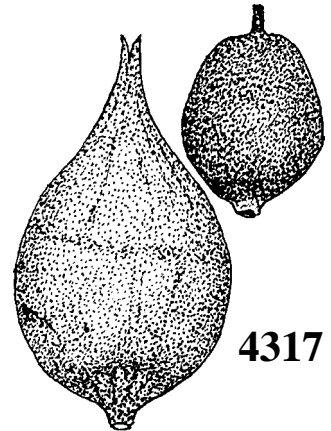
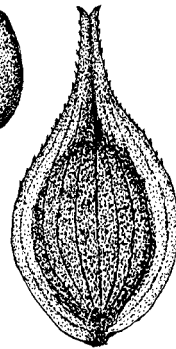
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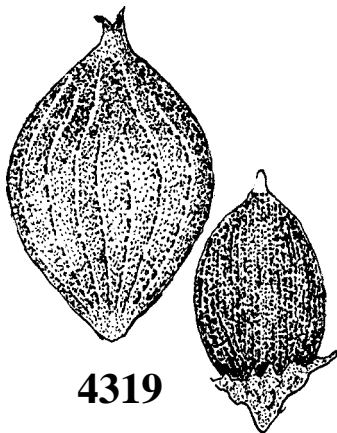
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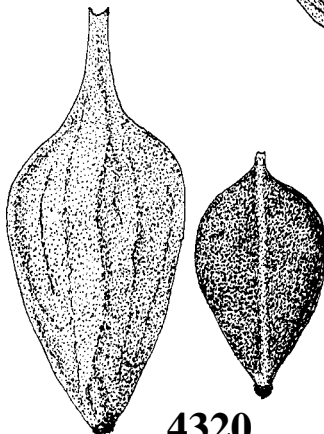
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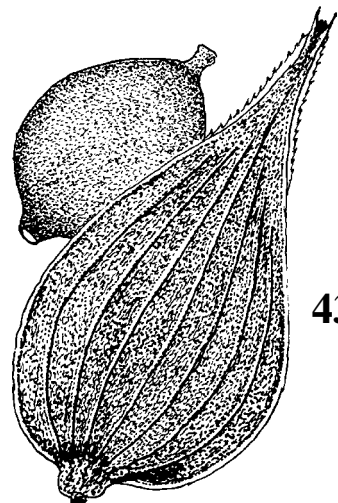
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sides convex and margin winged, gradually narrowed into dentate beak above, 3.8-4.3 x 2-2.3 mm. Surface scarce veinous or veinless, lustrous, blackish-brown. Seeds 4-angular ovate, compressed, transversal section elliptic, beak very short, 2.3-2.6 x 1.6-1.8 mm. Surface wrinkly, slight lustrous, pale-brown.  $2n = 56, 58$ . Native to Eurasia, forest clearings and roads, wood margins, shrubberies. Hu, Pl, Ro, Uk.

**4325. *Carex pallescens* L.** — Perennial, tufted, stems erect, 15-70 cm, slender, sharply 3-angular, scabrous only above. **Fruits achenes, prolonged obovate, blunt 3-angular, near spherical, 2.5-3 x 1.1-1.3 mm.** Surface multiveinous, longitudinal fine striate, sandy or reddish-sandy. Seeds obovate, 3-angular, beak short, bottom gradually narrowed, 1.7-2.1 x 1-1.2 mm. Surface reticulate-foveate, lustreless or lustrous, greyish dark-brown or pale-brown.  $2n = 62, 64, 66$ . Native to Euro-Siberia, forest clearings and cut-over areas, roads, pastures, heathery lands; of all Carpathian regions.

**4326. *Carex panicea* L.** — Perennial, non-tufted, stems erect, 10-50 cm high, slender, bluntly 3-angular, glabrous. **Fruits achenes, slight asymmetric, elliptic, inflated, apex abruptly narrowed into short beak, 3.2-4 x 1.9-2.1 mm.** Surface indistinct veinous, fine longitudinal striate, yellowish or reddish-brown. Seeds obovate, 3-angular, beak long, bottom gradually narrowed, 2.2-2.8 x 1.5-1.8 mm. Surface foveate, lustreless, greyish-brown.  $2n = 32$ . Native to Eurasia, wet meadows, fenlands, peatbogs of montane and subalpine zones in all Carpathian regions.

**4327. *Carex paniculata* L., *Vignea paniculata* (L.) Rchb.** — Perennial, densely tufted, stems 40-100 cm high, rough, stiff, striate, 3-angular. **Fruits achenes, ovoid, dorsal side convex, ventral flattish, gradually narrowed into dentate beak above, 2.7-3.5 x 1.4-1.6 mm.** Surface mostly veinous in lower part. **Seeds very strong closed in achenes 2-2.5 x 1.3-1.5 mm.** Native to Europe, riverbanks, wet meadows, boundaries, fenlands, peatbogs and forest swamps. Br, Hu, Pl, Ro, Sk, Uk.

**4328. *Carex parviflora* Host., *C. nigra* All.** non Reichard — Perennial, tufted, stems erect, 10-20 cm high, stiff, smooth or faint scabrous above. **Fruits achenes (left), elliptic or obovate, strong flattish, 3-3.5 x 1.5-1.7 mm.** Surface veinless or indistinct veinous, lustreless, blackish-brown or black, at

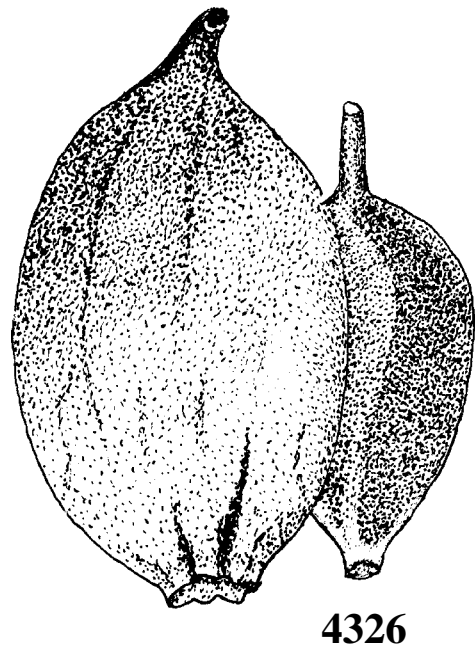
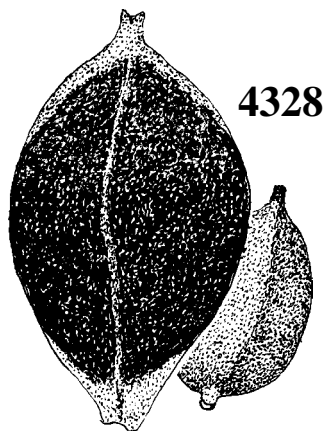
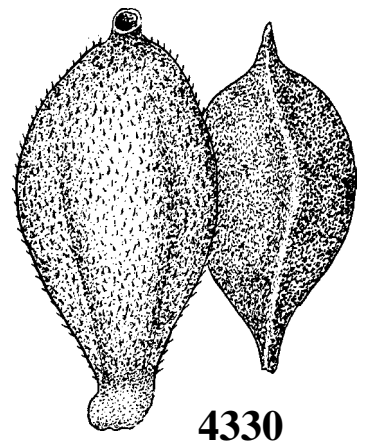
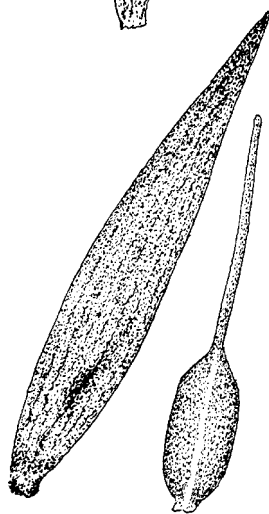
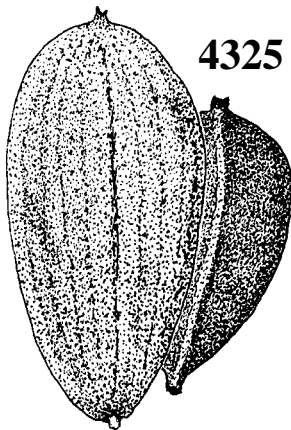
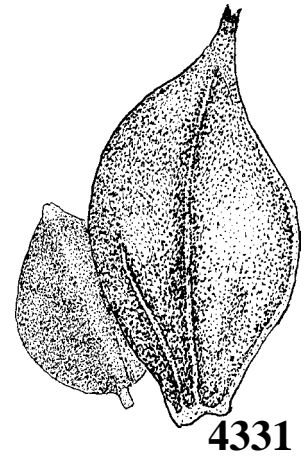
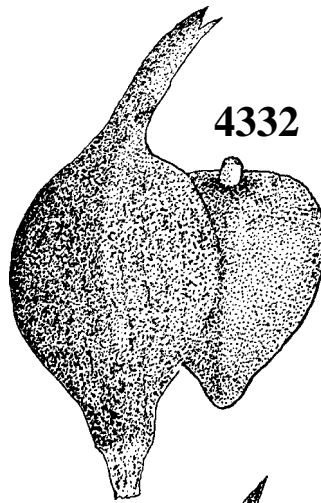
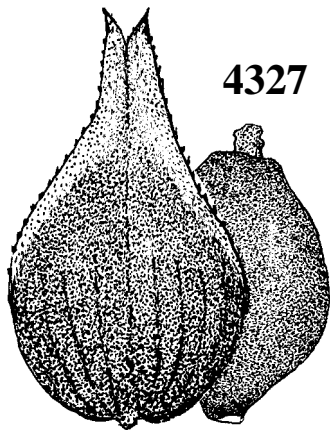
apex and bottom usually pale. Seeds (right) ovoid-trigonal, elliptic in transversal section, beak short, 1.8-2 x 0.9-1.1 mm. Surface faint wrinkly, lustrous, yellowish-brown.  $2n = 54$ . Native to Europe, snow deck-chairs, moist rocks and screes. Hu, Pl, Ro, Sk.

**4329. *Carex pauciflora* Lightf., *Psyllophora pauciflora* Schur** — Perennial,  $\pm$  scarcely tufted, stems erect, 5-30 cm high, thin, glabrous, obtuse 3-angular. **Fruits achenes, prolonged fusiform or spindleshaped, 6-7.5 x 1-1.1 mm.** Surface veinless or veins indistinct, acuminate, straw-coloured. Seeds cylindric, blunt 3-angular, with very (up to 5 mm) long beak, 2.2-3 x 0.9-1 mm. Surface glabrous, yellowish-brown.  $2n = 76$ . Native to circumpolar territories, heathery lands, peatbogs and swamp meadows. Br, Pl, Ro, Sk, Uk.

**4330. *Carex pediformis* C. A. Mey., *C. pediformis* subsp. *rhizina* (Blytt) Podp.** — Perennial, caespitose, sometimes forming tussocks, stem 10-60 cm high, erect or ascending, scabrous at least above, basal sheaths reddish-brown. **Fruits achenes, obovate-trigonal, narrowed at apex into an entire beak and into a leglet at bottom, 3.2-4 x 1.6-1.8 mm.** Seeds obovate-trigonal, narrowed at apex and bottom, 2.6-2.9 x 1.4-1.6 mm.  $2n = 70$ . Native to Eurasia, overgrown rocks and grass-overgrown canyons. Pl, Ro, Sk, Uk.

**4331. *Carex pendula* Huds., *C. maxima* Scop.** — Perennial, densely tufted, stems erect, 50-200 cm high, sharply 3-angular, rough, slender, glabrous above. **Fruits achenes, elliptic or ovate, inflated, 2.4-3 x 1.3-1.5 mm.** Surface faint longitudinal striate, veinless or faint veinous, pale-green or brownish-green. **Seeds obovate-trigonal, apex with short beak, bottom gradually narrowed, 1.3-1.7 x 0.9-1.1 mm.** Surface glabrous, lustreless, yellowish-brown or brown.  $2n = 58 (60)$ . Native to Europe, moist forest meadows and clearings, screes, lowland forests and shrubberies. Hu, Mo, Pl, Ro, Sk, Uk.

**4332. *Carex pilosa* Scop.** — Perennial, non-tufted, stems erect, 20-50 cm high, slender, shallowly 3-angular, glabrous. **Fruits achenes, spherical-obovate, weakly 3-angular, abruptly narrowed into smooth, 1.5 mm long beak, legged bellow, 4-5 x 1.8-2.2 mm.** Surface thin-veinous, brown. **Seeds trigonal, obovoid, apex truncate with short beak, 2-2.4 x 1.5-1.8 mm.** Surface glabrous, lustreless, pale-terracotta.  $2n = 44$ . Native to Eurasia,



shady, leafy woods on wet, sand-loamy soils; in all Carpathian territories.

**4333. *Carex pilulifera* L.** — Perennial, densely tufted, stems slender, 10-30 cm high, faintly bended, sharply 3-angular, glabrous,  $\pm$  scabrous above. **Fruits achenes, obovate, 3-angular, apex abrupt narrowed into short beak, bottom with leglet, 2.4-3 x 1.2-1.4 mm. Surface veinless, whole corpus downy, grey or greyish-brown. Seeds ovate, 3-angular, 1.3-1.4 x 1.1-1.2 mm. Surface foveate, lustreless, greyish-brown.  $2n = 18$ .** Native to Europe, dryer pine-forests and cut-over areas, heathery lands, pastures. Br, Hu, Pl, Ro, Sk, Uk.

**4334. *Carex polyphylla* Kar. et Kir., *C. divulsa* subsp. *leersii* (Kneucker) Walo Koch** — Perennial, robust plant, 60-100 cm high, stems rough, leaves 3-6 mm wide. **Fruits achenes, ovoid, convex at both sides, upper half gradually narrowed into slight dentate beak, roundish at base, 4.3-5 x 2-2.4 mm. Surface of bottom part veinous, smooth, lustrous, dark-brown. Seeds ovate, compressed, transversal section oval, beak short, 2.4-2.8 x 1.8-2 mm. Surface waved, lustrous, brown,  $2n = 58$ .** Native to Europe, dryer, light woods and shrubberies. Ro, Uk.

**4335. *Carex praecox* Schreb., *C. schreberi* Schrank** — Perennial, stems erect, 10-40 cm high, slender, sometimes scabrous above. **Fruits achenes, elliptic or ovate, dorsal side convex, ventral flattish, 3.3-3.7 x 1.1-1.3 mm. Surface mostly indistinct veinous, reddish-brown. Seeds ovoid, compressed, transversal section  $\pm$  ellipsoid, 1.6-2 x 0.9-1.1 mm. Surface wrinkly, slight lustrous, brown.  $2n = 58$ .** Native to Eurasia, dryer pastures, meadows, boundaries, embankments and slopes; throughout the Carpathians.

**4336. *Carex pseudocyperus* L.** — Perennial, tufted, stems erect, 30-100 cm high, sharply 3-angular, scabrous. **Fruits achenes (right), ovoid-lanceolate, slight flattish, inflated, 3-angular, gradually narrowed into beak, 4-5 x 1.3-1.5 mm. Surface protrude veinous, smooth, lustrous, whitish-brown. Seeds (left) ellipsoid, 3-angular, apex with long beak, 1.2-1.5 x 0.7-0.9 mm. Surface faint wrinkly, slight lustrous, pale-brown.  $2n = 66$ .** Native to Eurasia and North America, overgrown banks of ponds and rivers, boundaries, lowland woods; in all Carpathian territories.

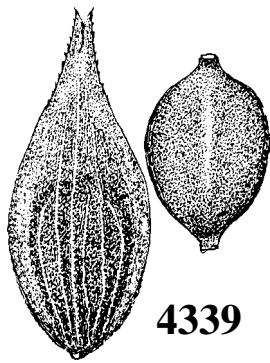
**4337. *Carex pulicaris* L., *Vignea pulicaris* (L.) Rchb.** — Perennial, scarcely tufted, stems erect, 5-25 cm high, thin, bluntly 3-angular, up to  $\pm$  oval, glabrous. **Fruits achenes, prolonged ellipsoid, acuminate to beak, 4-5 x 1.2-1.5 mm. Surface veinless, smooth, lustrous, reddish to blackish-brown. Seeds cylindric, compressed, transversal section oval, with long beak at apex, 2.5-2.8 x 1.1-1.3 mm. Surface faint wrinkly, lustrous, greyish-brown.  $2n = 58-60$ .** Native to Europe, peatbogs, meadows, pastures and springheads. Pl, Sk.

**4338. *Carex punctata* Gaudin** — Perennial, densely caespitose, stem 15-50 cm high, leaves 4-8 mm wide, bright-green. **Fruits achenes, slight inflated, narrow winged around, with slender veins and a smooth beak, 2.7-3 x 1.3-1.5 mm. Surface shining. Seeds obovoid-trigonus, planoconvex, apex with short beak, 1.9-2.1 x 1.1-1.3 mm. Surface waved, lustreless, some areas covered with whitish film, dark-brown.  $2n = 68$ .** Native to Europe, damp, grassy or rocky places, usually near the sea. Pl.

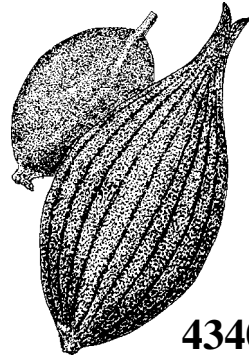
**4339. *Carex remota* L., *Vignea remota* (L.) Rchb.** — Perennial, densely tufted, stems 30-60 cm high, thin, sharply 3-angular, scabrous above, feeble to procumbent. **Fruits achenes, ovoid-clavate, flattish, dorsal side convex, ventral concave, 2.6-3.2 x 1.1-1.3 mm. Surface protrudent veinous, pale-brown. Seeds obovate, slight trigonus, compressed, beak short, 1.5-1.7 x 0.9-1 mm. Surface longitudinal striate, lustreless, pale-brown.  $2n = 62$ .** Native to Eurasia, lowland woods, springheads, banks of forest brooks and roads. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4340. *Carex riparia* Curtis** — Perennial, non-tufted, stems erect, 60-200 cm high, rough, sharply 3-angular, scabrous. **Fruits achenes, ovoid, inflated, 3-angular, bilateral convex, beak short, 2-toothed, 4.8-6 x 2-2.5 mm. Surface multiveinous, grayish. Seeds ellipsoid, trigonus, 3-3.5 x 1.5-1.8 mm. Surface longitudinal faint striate, lustreless, brown.  $2n = 72$ .** Native to Eurasia, overgrown river sides, meadows, swamps and boundaries, lowland woods of warmer areas; in all Carpathian territories.

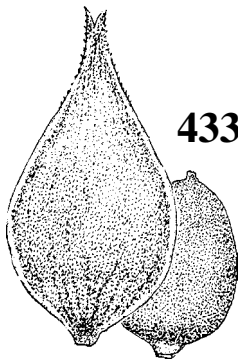
**4341. *Carex rostrata* Stokes ex With., *C. inflata* auct. non Huds.: Krecz.** — Perennial, non-tufted, stems erect, 30-60 cm high, bluntly 3-angular, glabrous,  $\pm$  scabrous above. **Fruits achenes, ovoid, inflated, with slender beaks, 3.8-5.5 x 2.1-2.7 mm. Surface thin veinous, lustreless, smooth, whitish-brown. Seeds obovoid, trigonus, beak long, 1.9-2.3 x 1-**



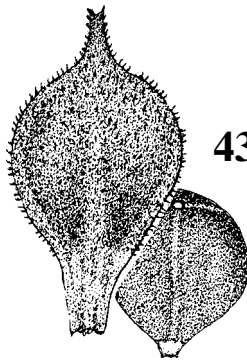
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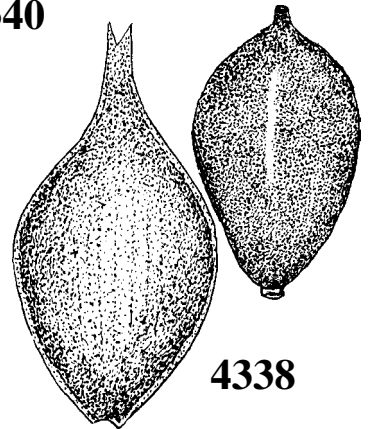
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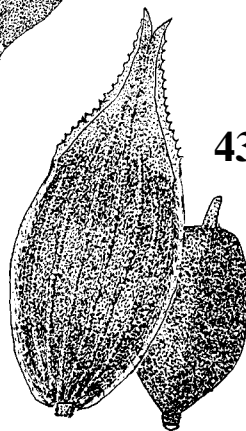
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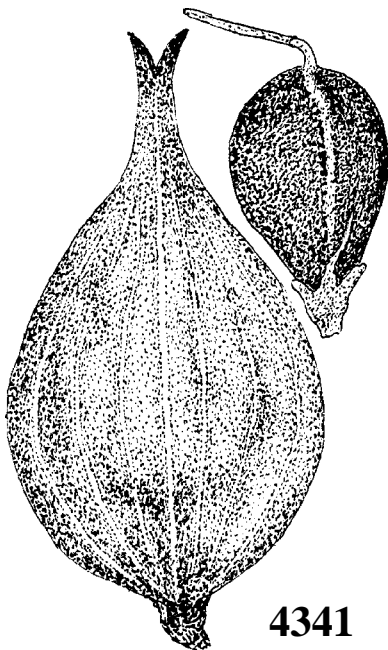
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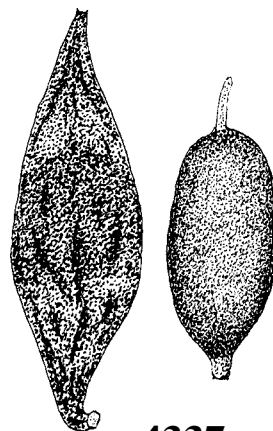
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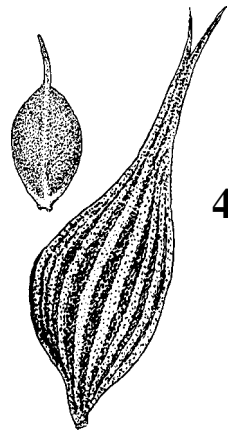
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**1.3 mm. Surface faint longitudinal striate, lustreless, brown.  $2n = 60, 72, 74, 76, 82$ .** Native to circumpolar territories, overgrown riversides, swampy meadows, boundaries and peatbogs. Hu, Pl, Ro, Sk, Uk.

**4342. *Carex rupestris* All., *C. petraea* Wahlenb.** — Perennial, caespitose, stems erect, ascending or procumbent, 5-20 cm high, bluntly 3-angular, scabrous at apex. **Fruits achenes (left), obovoid, planoconvex or concavo-convex, margin narrow winged, apex with short beak, 2.5-3 x 1.3-1.5 mm. Surface distinctly venous, partly reddish and yellowish. Seeds (right)  $\pm$  spherical, planoconvex, with 2 furrows on dorsal side, apex with short beak, 1.9-2.1 x 1.2-1.4 mm. Surface wrinkly, lustreless, partly covered with whitish film, dark-grey, top black.  $2n = 50-52$ .** Native to northern Europe, dry, rocky and stony places. Pl, Ro, Sk, Uk.

**4343. *Carex saxatilis* Wahlenb., *C. bigelowii* subsp. *nardeticola* Holub** — Perennial, non-tufted, stems 5-30 cm high, leaves 4-7 mm wide. **Fruits achenes, ellipsoid, flattish, beak short, 3.2-3.8 x 1.9-2.1 mm. Surface indistinct venous, wrinkly, lustreless, lower part dirty-white, upper purple. Seeds obovoid, 3-angular, beak as long as the achene, 1.9-2.1 x 1.6-1.8 mm. Surface lustrous, pale-brown.  $2n = 70$  (68).** Native to Euro-Siberia, moist, grassy and stony or peaty mountain meadows. Sk.

**4344. *Carex secalina* Willd. ex Wahlenb., *C. lichenfeldiana* Schur** — Perennial, densely tufted, stem slender, 10-30 cm high. **Fruits achenes, prolonged ovoid, dentate only at border and beak, 5-5.6 x 1.6-1.8 mm. Surface indistinct venous, smooth, straw-coloured. Seeds ovoid, slight 3-angular, with longer beak, 2.9-3.3 x 1-1.2 mm. Surface distinct waved, lustreless, dark-grey.** Native to Eurasia, moist and saline meadows, occasionally overflowed soils. Hu, Mo, Pl, Ro, Sk, Uk.

**4345. *Carex sempervirens* Vill., *C. tatrorum* Zapal.** — Perennial, densely tufted, stems erect, 15-40 cm high, thin, smooth, obtusely 3-angular. **Fruits achenes (right), prolonged ellipsoid, narrow wing short ciliary, appressed in upper part and at beak, 4.5-5.5 x 1-1.2 mm. Surface scarce tomentose, tender venous, yellowish- to blackish-brown. Seeds (left) ellipsoid, 3-angular, narrowed to beaked above, 2.2-2.6 x 0.9-1.1 mm. Surface faint foveate, lustreless, dark-grey.  $2n = 56$ .** Native to

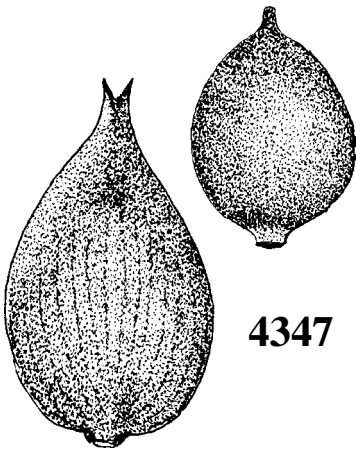
Europe, mountain meadows and stouted screes. Pl, Ro, Sk, Uk.

**4346. *Carex spicata* Huds., *C. contigua* Hoppe** — Perennial, tufted, stems erect, 20-100 cm high, scabrous above. **Fruits achenes (left), ovoid-lanceolate, flattish, apex with narrow dentate wings, gradually narrowed into beak, 5-5.5 x 2.5-2.7 mm. Surface weakly venous only at base, greenish yellow-brown. Seeds (right) compressed, obtuse 4-angular ovoid, with short beak, transversal section ellipsoid, 2.5-2.9 x 1.8-2 mm. Surface faint wrinkly, lustreless, brown.  $2n = 58$ .** Native to Eurasia, meadows, rare in light, shrubby woods and shrubberies. Br, Mo, Pl, Uk.

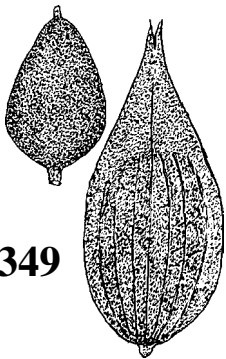
**4347. *Carex stenophylla* Wahlenb., *Vignea stenophylla* (Wahlenb.) Rchb.** — Perennial, stems erect, thin, 10-30 cm in high, rigid, bluntly 3-angular, glabrous. **Fruits achenes, ovoidal, convex outside and inside, lateral winged, 3-4 x 1.8-2.2 mm. Surface protrudent venous, lustrous, greenish- and dark-brown. Seeds ovoid, nearly roundish, compressed, 2.2-2.4 x 1.5-1.7 mm. Surface faint wrinkly, slight lustrous, brown,  $2n = 60, 62$ .** Native to Eurasia, dry, sandy and clayey steppe, meadows and pastures, sometimes saline soils. Hu, Mo, Pl, Ro, Sk, Uk.

**4348. *Carex strigosa* Huds., *C. leptostachys* Ehrh.** — Perennial, loosely tufted, stems erect, glabrous, shallowly 3-angular. **Fruits achenes, ovoid, 3-angular, gradually narrowed above and below, beak short, 3-3.5 x 0.7-0.9 mm. Surface protrudent multi-venous, truncate, greenish-brown. Seeds ellipsoid, 3-angular, 1.4-1.6 x 0.7-0.8 mm. Surface faint wrinkly, lustreless, pale-brown.  $2n = 66$ .** Native to Europe, springheads, lowland woods, banks of forest brooks, moist to wet grounds. Hu, Pl, Ro, Sk.

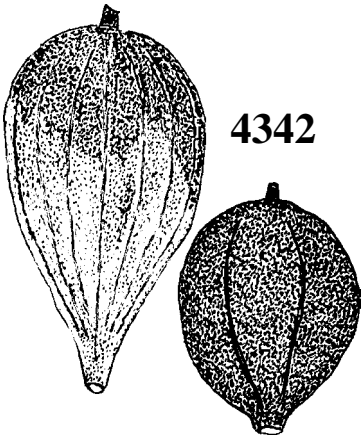
**4349. *Carex supina* Willd. ex Wahlenb., *C. wohllebii* Hoppe** — Perennial, scarcely caespitose, stems 10-30 cm high, slender, scabrous above, basal sheaths purplish-brown. **Fruits achenes, oblong-ovoid, planoconvex, abrupt contracted into a short cylindric, truncate to 2-fid beak, 3.3-3.7 x 1.3-1.5 mm. Seeds ovoid, biconvex, dorsal side indistinct rooflike, with short beak at apex, 1.7-1.9 x 0.9-1.1 mm. Surface wrinkly, faint lustrous, pale-brown.  $2n = 38, 44$ .** Native to Eurasia, sandy pastures, steppe slopes, sandbanks; in all Carpathian regions.



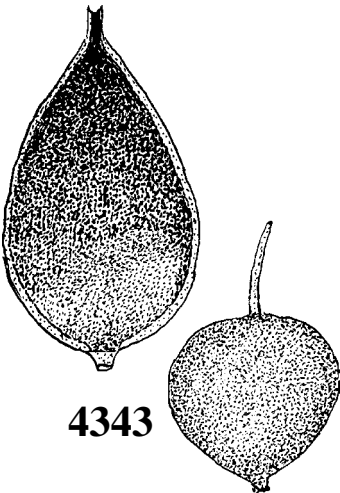
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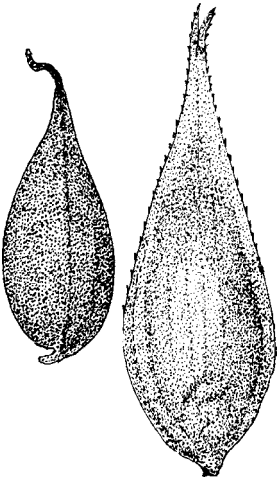
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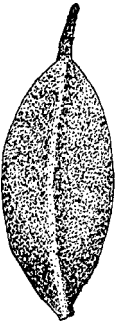
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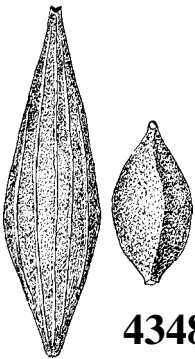
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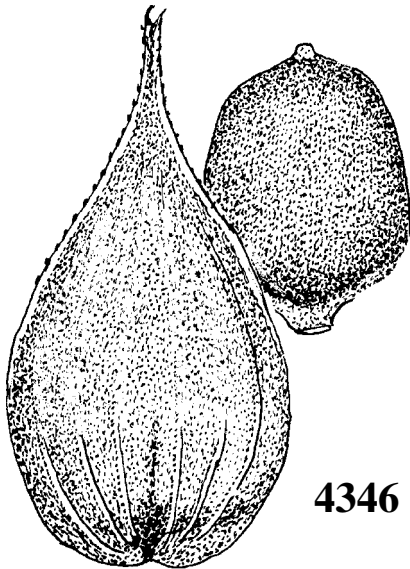
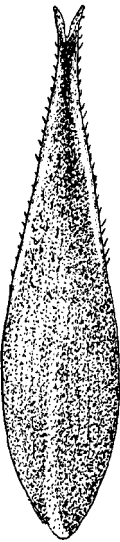
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**4350. *Carex sylvatica*** Huds. — Perennial, tufted, stems erect, 10-200 cm high, 3-angular, glabrous, droopy above, scarcely leafy below. **Fruits achenes, ellipsoid or obovoid, gradually narrowed into long, 2-toothed beak, 5-5.6 x 1.4-1.7 mm. Surface ± veinless, slight lustrous, purple. Seeds ellipsoid, 3-angular, with short beak, 2.6-3 x 1.4-1.6 mm. Surface longitudinal striate, lustreless, brown. 2n = 58.** Native to Europe, moist, leafy woods and shrubberies, banks of forest brooks, springheads; in all Carpathian territories.

**4351. *Carex tomentosa*** L., *C. filiformis* auct. non L. — Perennial, non-tufted, stems erect, 20-40 cm high, slender, scabrous above. **Fruits achenes, obovoid up to spherical, beak very short or absent, 2.3-2.7 x 1.5-1.7 mm. Surface leathery, veinless, dense downy, dull, rusty-brown. Seeds obovoid, 3-angular, beak very short, 1.6-1.8 x 1-1.2 mm. Surface faint reticulate-foveate, dull, pale-brown. 2n = 48.** Native to Eurasia, lowland woods, moorlands, moist and fen-meadows; throughout the Carpathians.

**4352. *Carex umbrosa*** Host, *C. polyrrhiza* Wallr. — Perennial, densely tufted, stem erect, 10-45 cm high, slender, bluntly 3-angular, ± scabrous only above. **Fruits achenes, obovoid, ± roundish in transversal section, apex with short beak, bottom with strong leg, 2.5-3 x 1.2-1.4 mm. Surface indistinct veinous, hairy, brown. Seeds obovoid, trigonous, beakless, 1.5-1.7 x 1.1-1.3 mm. Surface faint waved, slight lustrous, dark-purple. 2n = (62), 66.** Native to Europe, moist woods and cut-over areas, fen-meadows. Br, Hu, Pl, Ro, Sk, Uk.

**4353. *Carex vaginata*** Tausch, *C. sparsiflora* (Wahlenb.) Steud. — Perennial, stems erect, 15-40 cm high, rigid, bluntly angular. **Fruits achenes (left), ovoid, shallow 3-angular, 3.2-3.8 x 1.5-1.7 mm. Surface ± veinless, smooth, lustrous, yellowish or pale-brown. Seeds (right) ovoid, 3-angular, with beak at apex, 2.6-2.8 x 1.4-1.6 mm. Surface waved, lustreless, greyish-brown. 2n = 32.** Native to circum-polar territories, mountain moist and peaty meadows. Br, Pl, Sk, Uk.

**4354. *Carex vesicaria*** L., *C. inflata* Huds. — Perennial, stems erect, 30-150 cm high, sharply 3-angular, scabrous above. **Fruits achenes, ovoid-ellipsoid, inflated, gradually narrowed into beak, 6-7 x 2.3-2.7 mm. Surface fine multiveinous,**

**whitish-yellow. Seeds ellipsoid, 3-angular, beak long, 2.1-2.3 x 1.5-1.7 mm. Surface faint wrinkly, lustreless, dark-grey. 2n = 74, 82, 86.** Native to Eurasia and North America, swampy riverbanks, overgrown pond edges, water ditches; in all Carpathian regions.

**4355. *Carex vulpina*** L., *Vignea vulpina* (L.) Rchb. — Perennial, stems stiff erect, 30-100 cm high, winged, 3-angular, striate, considerably scabrous. **Fruits achenes, ovoid-ellipsoid, outline convex, inline flat, gradually narrowed into dentate beak, 3.8-4.4 x 1.8-2.2 mm. Surface distinct multiveinous, waved, dull, dark-brown. Seeds ovoid, compressed, beak short, 2.1-2.4 x 1.5-1.7 mm. Surface waved, lustrous, brown. 2n = 68.** Native to Eurasia, moist to wet meadows, boundaries, overflowing river banks; throughout the Carpathians.

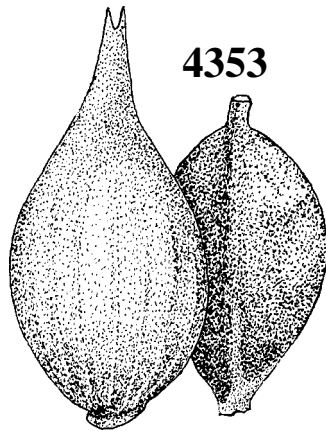
**4356. *Carex vulpinoidea*** Michx., *C. microperma* Wahlenb. — Perennial, tufted, stems erect, 30-100 cm high, stiff, slender, sharply 3-angular, scabrous above. **Fruits achenes, inflated, roundish, ovoid, flattish, gradually narrowed into beak, 3.8-4.4 x 1.7-1.9 mm. Surface distinct multiveinous, lustrous, pale-brown. Seeds with rests of reticulum, 1.4-1.6 x 1.1-1.3 mm. Surface lustrous, brown. 2n = 52, 54.** Native to North America; dragging into the Carpathians with imported goods. Ro (?), Sk.

#### 174. POACEAE

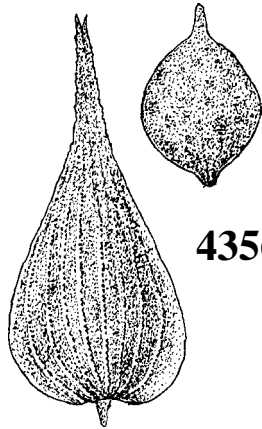
**4357. *Oryza sativa*** L. — Annual, tufted, blades 10-150 cm high, erect, bare, roundish, leafy. **Florets (left), ellipsoid, closely enclosed by dry lemma and palea forming the husk. Caryopses (right) ellipsoid, compressed, apex roundish, bottom with large hilum, 6-7 x 2.6-3 mm. Surface longitudinal, shallow furrowed, smooth, slight lustrous, yellowish. 2n = 24, 36, 48.** Native to southern Asia; rarely cultivated in the Carpathians in the warmest areas.

**4358. *Saccharum ravennae*** (L.) Murray, *Erianthus ravennae* (L.) P. Beauv. — Perennial, stems erect, strong, up to 1-2 m high, leaves linear, 10-15 mm wide, very rough at margins. **Florets (right) lanceolate, lemma acuminate, awnless, c. 5 x 1 mm. Surface glabrous, dull, upper part paler-, bottom darker-brown. Caryopses (left) lanceolate, apex acuminate, bottom round. Surface lustreless, pale-brown. 2n = 20.** Native to the Mediterranean, sandy or swampy stands, riverbanks and deposits. Ro.

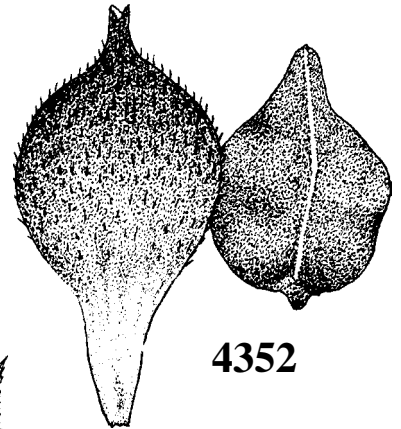




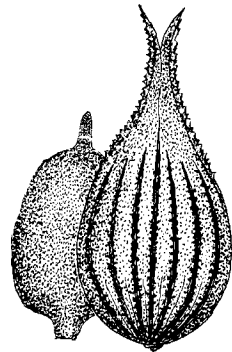
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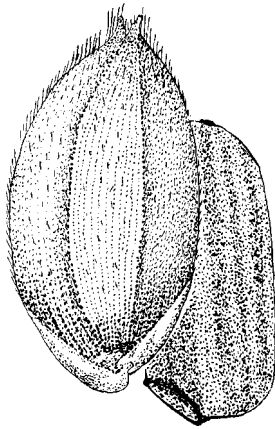
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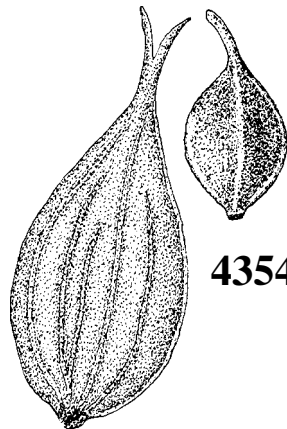
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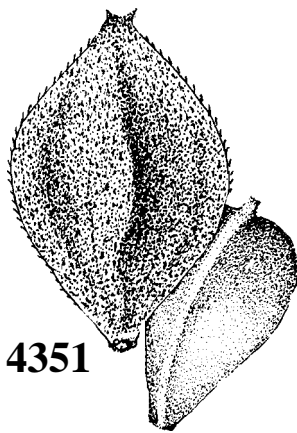
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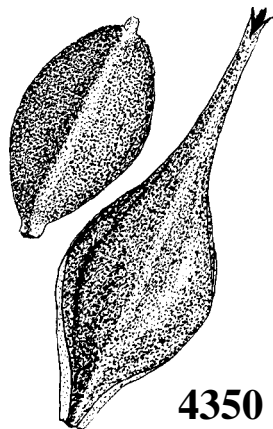
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**4359. *Leersia oryzoides* (L.) Sw., *Phalaris oryzoides* L.** – Perennial, blades up to 200 cm high, ascendent or procumbent, branched at base. **Florets (left) short pedicellate, lemma ciliary at keel and margins, 4.8-5.2 x 1.6-1.8 mm. Surface greenish-grey. Caryopses (right) obovate, apex round, bottom narrowed with hilum, 2.6-3 x 1.3-1.5 mm. Surface longitudinal faint striate, slight lustrous, reddish-brown.  $2n = 48$ .** Native to circumpolar territories, banks of stagnant and slowflowing waters, dead arms and ditches, muddy boundaries, fen-meadows; in all Carpathian territories.

**4360. *Stipa borysthena* Klokov ex Prokudin, *S. sabulosa* (Pacz.) Sljuss.** – Perennial, densely and strongly tufted, blades greyish-green, leaves bristly hirsute. **Florets (right and left) small, ventral hairlet row making 2/3-3/4 of the floret, dorsal and lateral rows shorter, awn 10-13 cm long, lower part broader, screwy, upper hairy, 16-20 x 1-1.2 mm. Surface dull. Caryopses (middle) slender with distinct hilum, 10-13 x 0.8-1 mm. Surface dark-brown.** Native to Eurasia, sandy, basic or neutral, calcareous, in summer dry soils. Pl, Ro, Sk, Uk.

**4361. *Stipa bromoides* (L.) Dörfler, *Aristella bromoides* (L.) Bertol.** – Perennial, blades erect or ascendant, 40-100 cm high, bulbiformly roughened at base, glabrous, striate. **Florets (left) spindle-shaped, awn 2-3 cm long, lower half screwy, 8-9 x 1.2-1.4 mm. Surface hirsute, whitish. Caryopses (right) spindleshaped, apex narrowed, bottom with hilum, 5.5-6.2 x 1-1.2 mm. Surface glabrous.  $2n = 28$ .** Native to the Mediterranean, rare on light scrubs, slopes, sunny and rocky places. Ro.

**4362. *Stipa capillata* L.** – Perennial, tufts slender, 20-50 cm high, blades up to 100 cm high. **Florets spindleshaped, mature florets unregular screwy, ventral hairlets row leading as far as awn base, the other rows being shorter, awn 12-20 cm long, from fine papillae scabrous, 10-13 x 0.8-1 mm. Surface smooth, hairless. Caryopses linear, slender, ventral side with dark-brown longitudinal furrow, 7-8 x 0.6-0.7 mm. Surface smooth, brown.  $2n = 44$ .** Native to Eurasia, meadow and stony steppes, dry, warmed up basic to neutral grounds. Au, Hu, Mo, Pl, Ro, Sk, Uk.

**4363. *Stipa crassiculmis* Smirn., *S. tranhilumpatica* Klokov** – Perennial, blades enclosed into sheath, bristly hirsute under nodules and panicle, leaves few, c. 2 mm in diam., junciform, strongly aculeate-scabrid on the adaxial surface. **Florets (right) linear, dorsal**

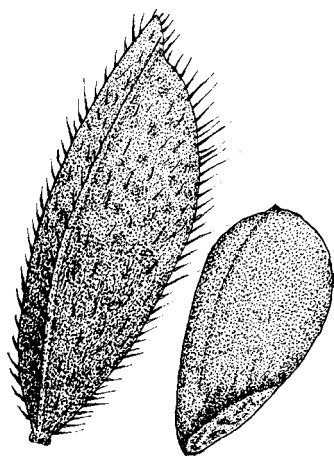
**row longer than the lateral, ventral hairlet row leads as far as awn base, awn 3-35 cm long, lower part screwy, coarse upper part feathery hirsute (hairs up to 7 mm long), 20-26 x 1.9-2.1 mm. Caryopses (left) oblong-cylindric, transversal slight undulated, ventral side with longitudinal furrow, bottom acuminate, 12-14 x 1.4-1.6 mm. Surface lustreless, brown.** Native to Eurasia, sunny and stony slopes, drying and warmed up, neutral grounds. Ro, Sk.

**4364. *Stipa dasyphylla* (Czern. ex Lindem.) Trautv., *S. glabrata* (Smirnov) Martinovský** – Perennial, tufts robust, blades up to 80 cm high, sheaths of leaves hirsute, often purple. **Florets linear, ventral hairlet row leads as far as awn base, the other rows are very low, awn 30-45 cm long, lower part bare and screwy, upper one thinner and feathery hirsute, 18-22 x 1.2-1.5 mm. Surface smooth, slight lustrous, yellowish. Caryopses linear, on ventral side with longitudinal dark-brown furrow, 12-14 x 0.9-1.1 mm. Surface dull, brown.** Native to Euro-Siberia, dry, sunny rocks and screes, light shrubberies, andesite and calcite grounds. Hu, Mo, Ro, Uk.

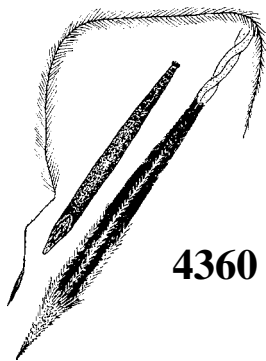
**4365. *Stipa eriocalis* Borbás, *S. pennata* auct. non L.** – Perennial, blades 30-60 cm high, sometimes puberulent, panicle c. 10 cm long, contracted, caespitose. **Florets spindleshaped, ventral hairlet row leads as far as awn base, dorsal hairlet row absent, awn 13-20 cm long, 15-20 x 1.8-2 mm. Surface smooth, lower part hairy, yellowish-brown. Caryopses slight undulated, 11-14 x 1-1.4 mm. Surface smooth, dull, brown.  $2n = 44$ .** Native to Europe, dry dolomite and calcite slopes, warmed up and stony stands. Hu, Ro, Sk, Uk.

**4366. *Stipa joannis* Čelak., *S. pennata* L.** – Perennial, densely and strongly caespitose, blades 30-60 cm high, downy. **Florets oblong, narrow lanceolate or cylindric, often bent irregular, awn 20-30 cm long, setae plumose, 16-18 x 1.4-1.5 mm. Caryopses cylindric, 12-14 x 1.1-1.3 mm. Surface smooth, dull.  $2n = 44$ .** Native to Eurasia, drying and warmed up, often calcareous grounds. Hu, Mo, Pl, Ro, Sk, Uk.

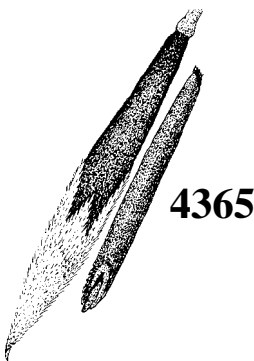
**4367. *Stipa lessingiana* Trin. et Rupr.** – Perennial, blades erect, 30-80 cm high. **Florets narrow lanceolate or cylindric, awn 14-20 cm, lower part (4-5 cm) hairless, upper part feathery hirsute (hairs c. 1 mm long), 8-10 x 0.7-0.9 mm. Surface whole dense whitish hirsute. Caryopses cylindric, ventral side with longitudinal dark-brown furrow, roundish**



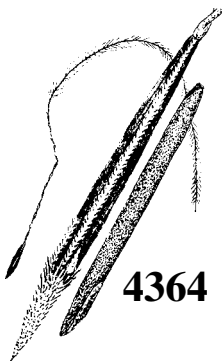
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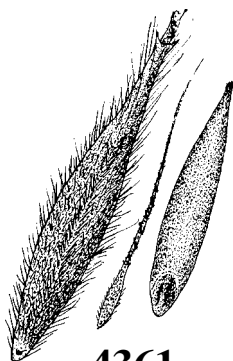
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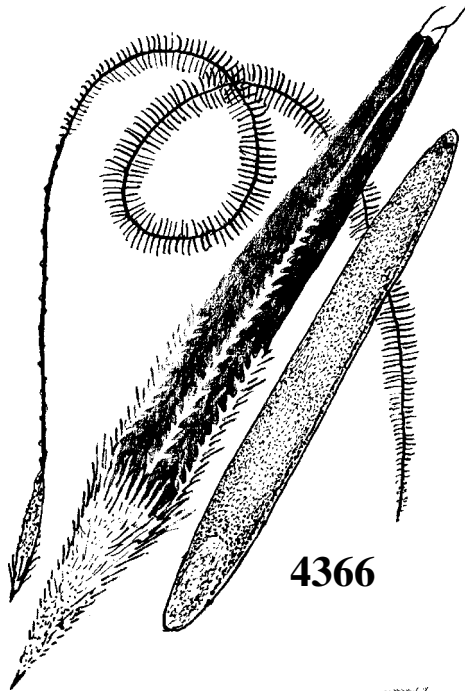
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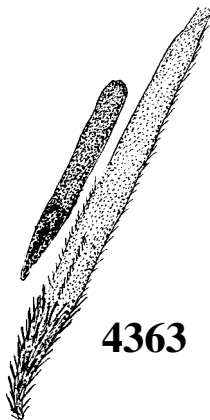
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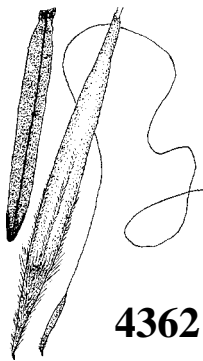
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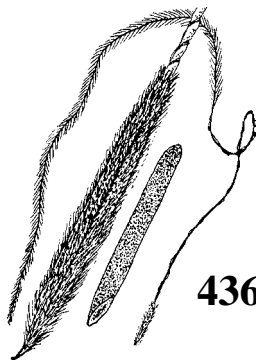
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in transversal section, 5-6 x 0.6-0.7 mm. Surface slender smooth, dull, brown.  $2n = 44$ . Native to central Europe, sunny, dry, grassy steppes. Mo, Ro, Uk.

**4368. *Stipa pulcherrima*** K. Koch, *S. grafiانا* Steven – Perennial, tufts robust, free, easily crumbled, blades up to 120 cm high, hirsute under panicle. Florets (right and middle) narrow lanceolate or cylindric, dorsal row longer than lateral one, ventral hairlet row goes up to awn base, awn 40-48 cm long, upper part screwy and hairy, 18-25 x 1.1-1.3 mm. Surface smooth, all yellowish-brown. Caryopses (left) slight transversal undulated, 8-10 x 1-1.2 mm. Surface smooth, dull.  $2n = 44$ . Native to Eurasia, sunny, grassy and stony slopes, steppe hills, old vineyards on warmed up and drying out grounds. Hu, Mo, Pl, Ro, Sk, Uk.

**4369. *Stipa tirsia*** Stev., *S. stenophylla* (Czern. ex Lindem.) Trautv. – Perennial, strongly tufted, tufts up to 15 cm in diam., blades leafy, up to 70-100 cm high, basal leaves up to 100 cm long. Florets narrow lanceolate or cylindric, ventral hairlet row making as much as up to 2/3-3/4 of the floret, dorsal and lateral rows being shorter, awn 30-50 cm long, lower part screwy, yellowish, upper one hairy, 18-22 x c. 2 mm. Surface smooth, yellowish-brown. Caryopses cylindric, hilum distinct, 12-14 x 1.5-1.7 mm. Surface dull, dark-brown.  $2n = 44$ . Native to Eurasia, dry meadows and steppes. Hu, Mo, Pl, Ro, Sk, Uk.

**4370. *Stipa ucrainica*** P. Smirnov – Perennial, densely tufted, stems numerous, erect, 30-60 cm high, sheaths of the leaves glabrous. Florets lanceolate, round the base bristly, upper part smooth with two rows of short hairs, awn 30-40 cm long, lower part 6-9 cm long, glabrous, screwy, upper part feathery hirsute, 17-20 x 1.3-1.5 mm. Caryopses cylindric, apex short-hairy, 8-10 x 1.1-1.2 mm. Surface smooth, brown. Native to southeastern Europe, steppes, drying up, sunny and grassy grounds in the lowland zone. Mo, Ro, Uk.

**4371. *Oryzopsis virescens*** (Trin.) Beck, *Piptatherum virescens* (Trin.) Boiss. – Perennial, densely tufted, blades erect, up to 120 cm high, sheaths smooth. Florets barked, obovoid, dorsal side convex, ventral also convex with two faint haired ribs, apex narrowed into awn, bottom also narrowed with roundish hilum, 3-3.6 x 1.3-1.5 mm. Surface scarce whitish haired, smooth, high lustrous, black.

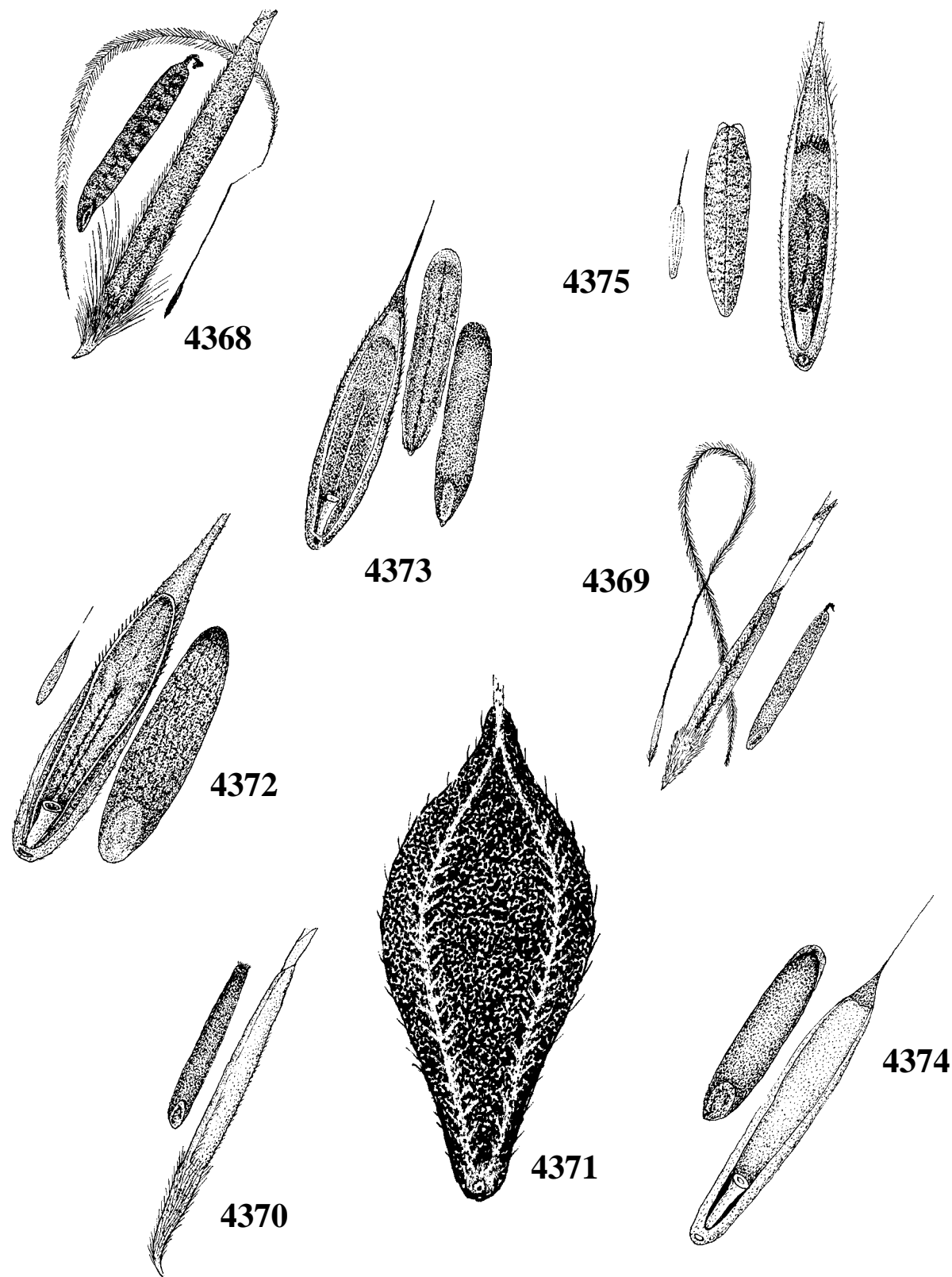
$2n = 24$ . Native to Eurasia, light woods, shrubby slopes, forest margins and clear-cut areas. Hu, Mo, Ro, Sk, Uk.

**4372. *Brachypodium distachyon*** (L.) Beauv., *Trachynia distachya* (L.) Link – Perennial, blades erect or geniculately ascendent, 10-30 cm high, ramified from base. Florets (left) oblong, lanceolate, awn as long as or longer than the floret, pale, hirsute in upper part, 10.5-12.5 x 1.9-2.1 mm. Surface of lemma bare on back or scarce and short hirsute on veins. Caryopses (right) elliptic, concavo-convex, 7.2-8 x 1.6-1.9 mm. Surface slight lustrous, greyish-brown. Native to the Mediterranean and Balkan regions, sandy stands, cultivated and ruderal areas. Ro (?), Uk.

**4373. *Brachypodium pinnatum*** (L.) P. Beauv., *Bromus pinnatus* L. – Perennial, weakly tufted, blades erect, 40-120 cm high, knots hirsute. Florets prolonged elliptic, apex gradually narrowed into 4-7 mm long awn, with short and roundish hilum below, 8.5-9.5 x 1.7-1.8 mm. Surface in upper half short hirsute, lustreless, straw-colored. Caryopses cylindric, concavo-convex, apex round, bottom with hilum, 6-6.6 x 1.2-1.4 mm. Surface dull, whitish-brown,  $2n = 28$ . Native to Eurasia, forest edges, light woods pastures, steppe meadows and shrubby slopes of all Carpathian regions.

**4374. *Brachypodium rupestre*** (Host) Roem et Schult., *B. pinnatum* var. *glabrum* Rchb. – Perennial, leaves greyish-green, spikelets 30-50 mm long, usually straight or slightly falcately bended. Florets oblong-elliptic, apex gradually narrowed into 3 mm long awn, shallow, roundish hilum below, 8-10 x 1.5-1.8 mm. Surface smooth, dull, straw-coloured. Caryopses cylindric, concavo-convex, 5-6.5 x 1.2-1.4 mm. Surface whitish-brown.  $2n = 14$ . Native to southeastern and southern Europe, rocky and shrubby slopes on calcite grounds; rarely hauling into the Carpathians along roads and railway-lines.

**4375. *Brachypodium sylvaticum*** (Huds.) P. Beauv., *Festuca sylvatica* Huds. – Perennial, tufted, blades erect or ascendant, feeble, scarcely hirsute. Florets prolonged, elliptic, dorsal side convex, ventral concave, with roundish hilum below, apex gradually narrowed into awn, 9.5-10.5 x 1.4-1.6 mm. Surface short hirsute, dull, straw-coloured. Caryopses oblong elliptic, dorsal side convex, ventral concave with longitudinal furrow, 6.3-6.9 x 1.2-1.3 mm. Surface glabrous, dull, brown.  $2n = 18$



(28, 56). Native to Eurasia, shady, lowland woods and shrubberies; in all Carpathian regions.

**4376. *Festuca altissima*** All., *F. sylvatica* (Pollich) Vill. non Huds., *Poa sylvatica* Pollich – Perennial, densely tufted, blades erect, 50-150 cm high. **Florets spindleshaped, convexo-concave, on ventral side 2-veinous, apex gradually narrowed, acuminate, awnless or very short awn, 4.5-5.5 x 0.8-1.1 mm. Caryopses cylindric, bottom narrowed, acuminate, with distinct hilum small, 3-4 x 0.7-0.9 mm. Surface lustreless, greenish-brown. 2n = 14 (42).** Native to Euro-Siberia, leafy woods and shrubberies. Hu, Pl, Ro, Sk, Uk.

**4377. *Festuca alpestris*** Roem. et Schult., *F. varia* subsp. *alpestris* Hack. – Perennial, blades 25-40 cm high, slender, scabrous above, basal sheaths smooth. **Florets broad elliptic, acuminate, lemma in upper part slight membranous, awnless, 5-6 x 1.1-1.3 mm. Surface smooth. Caryopses elliptic, concavo-convex, apex hairy, 3.3-3.6 x 0.9-1.1 mm. Surface wrinkly, lustreless, pale-brown.** Native to the Alps and Carpathians, rocks and screes of the subalpine zone. Ro.

**4378. *Festuca amethystina*** L. – Perennial, densely tufted, blades erect, thin, 40-150 cm high, with 3 nodules. **Florets spindleshaped, flattish, lemma with short awn, usually awnless, 3.8-4.5 x 0.7-0.9 mm. Surface smooth, rare scarce hirsute, dull, straw-coloured. Caryopses cylindric, concavo-convex, apex roundish, bottom with hilum, 2.2-2.5 x c. 0.6 mm. Surface glabrous, slight lustrous, reddish-brown. 2n = 28.** Native to Eurasia, leafy wood margins, shrubby, stony slopes and meadows, prevailing calcite and dolomite of the alpine zone. Hu, Pl, Ro, Sk.

**4379. *Festuca arundinacea*** Schreb. – Perennial, free tufted, blades 50-150 cm high, smooth,  $\pm$  roughed under panicle. **Florets elliptic, 5-veinous, apex gradually narrowed, lemma on apex 2-dentate, with very short awn or awnless, 7-8 x 1.5-1.7 mm. Surface glabrous, straw-colored. Caryopses cylindric, concavo-convex, apex roundish, bottom narrowed, 3-3.5 x 1.3-1.5 mm. Surface glabrous, wrinkly, dull, brown. 2n = 42.** Native to Eurasia, moist to wet meadows, banks along streams and lakes, boundaries, edges of lowland woods. Hu, Mo, Pl, Ro, Sk.

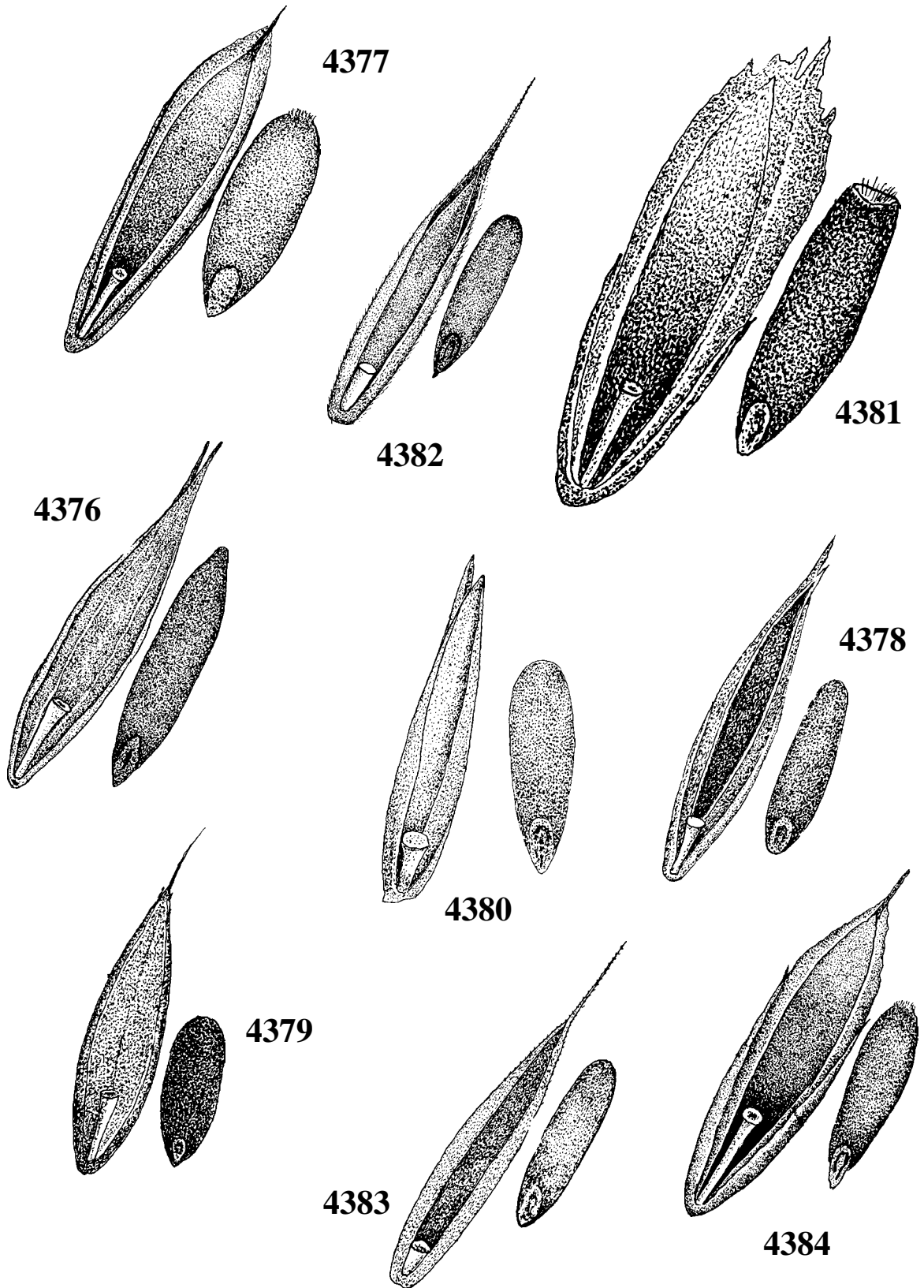
**4380. *Festuca capillata*** Lam. – Perennial, densely tufted, blades erect, 10-40 cm high, thin, very rough above. **Florets lanceolate, flattish, apex narrowed, acuminate, apiculate, without or with only very short awn, 2.7-3.5 x 0.5-0.7 mm. Surface smooth, glabrous, pale-brown. Caryopses  $\pm$  cylindric, concavo-convex, 1.3-1.8 x 0.4-0.6 mm. Surface smooth, glabrous, slight lustrous, pale- or dark-brown. 2n = 14 (28).** Native to central Europe, light woods, lawn and wood margins, cut-over areas, sandbanks, sunny slopes of upland and montane zones, drying up, poor,  $\pm$  acid soils; rarely hauling into the Carpathians or dubious. Ro, Uk.

**4381. *Festuca carpathica*** F. Dietr., *F. pseudolaxa* Schur – Perennial, densely tufted, blades 50-70 cm high, grey-green. **Florets elliptic, lemma lanceolate, distinct 5-veinous, apex broad, awnless, 5.6-6.2 x 1.2-1.4 mm. Surface back very short hirsute or coarse, apex membranous, brown. Caryopses cylindric, concavo-convex, apex round with hairbrushlet, bottom narrowed with hilum, 2.7-3.3 x 0.7-0.9 mm. Surface smooth, lustreless, brown. 2n = 28.** Native to the Carpathians, calcite rocks and screes, mountain meadows of dwarf pine areas. Pl, Ro, Sk, Uk.

**4382. *Festuca cinerea*** Vill., *F. duriuscula* L., *F. glauca* Lam. – Perennial, densely or gently tufted, blades strong, with 2 nodules, angular, glabrous. **Florets lanceolate, lemma 5-veinous, awned (1-4 mm long), 3.9-4.6 x 0.7-0.8 mm. Surface short hirsute or ciliate. Caryopses cylindric, concavo-convex, 2.4-2.6 x c. 0.6 mm. Surface glabrous, lustreless, dark-brown.** Native to Eurasia, rocky, grassy and sunny areas of lowland up to subalpine zones, in some subsp. Ro.

**4383. *Festuca dalmatica*** (Hack.) K. Richt. – Perennial, densely tufted, blades 10-50 cm high, glabrous, upper part scabrous. **Florets narrowly lanceolate, with awn, 4-4.6 x 0.7-0.8 mm. Surface glabrous, short hirsute only at apex and awn. Caryopses cylindric, concavo-convex, 2.4-2.6 x 0.5-0.6 mm. Surface glabrous, lustreless, brown.** Native to the South-East of Carpathians and Balkan mountains, rocky, grassy and sunny places on calcareous substrates of upland and montane zones. Ro.

**4384. *Festuca dimorpha*** Guss., *F. spectabilis* Schur – Perennial, densely tufted, blades 30-60 cm high, enclosed in 3-5 sheaths at base. **Florets (left) lanceolate or spindleshaped, compressed,**



5-veinous, lemma in upper part membranous, without or with short awn, 6.2-7.2 x 1.4-1.6 mm. Surface smooth, straw-coloured. Caryopses (right) obovate, concavo-convex, apex hairy, bottom narrowed with hilum, 3.3-3.6 x 0.9-1.1 mm. Surface slight wrinkly, lustreless, brown. Native to the Alps, Apennines and the Balkan mountains, rocky places of the subalpine zone; rarely hauling into the Carpathians or dubious. Ro.

**4385. *Festuca dominii*** Krajina, *F. vaginata* subsp. *dominii* (Krajina) Soó — Perennial, twigs of the panicle unfolded only in the time of flowering. Florets lanceolate, apex gradually narrowed, acuminate, hairy, with awn, bottom part hairless, 4-4.5 x 0.8-1 mm. Caryopses cylindric, concavo-convex, 2.2-2.6 x 0.5-0.6 mm. Surface glabrous, lustreless, pale-brown.  $2n = 14$ . Native to Europe, dry sandbanks of lowlands. Hu, Sk.

**4386. *Festuca drymeia*** Mert. et W. D. J. Koch, *F. montana* M. Bieb. non Savi — Perennial, free and scarcely tufted, blades 70-110 cm high. Florets ± spindleshaped, concavo-convex or planoconvex, lemma 5-veinous, apex acuminate, awnless, 5.5-6.5 x 1.1-1.3 mm. Surface glabrous. Caryopses ellipsoid, concavo-convex, apex hairy, bottom with hilum, 3.4-3.8 x 0.9-1.1 mm. Surface dull, blackish-brown.  $2n = 14$ . Native to Eurasia, light and also shady, leafy woods on moister soils. Hu, Pl, Ro, Sk, Uk.

**4387. *Festuca eskia*** Ramond, *F. varia* subsp. *eskia* (Ramond) Hack. — Perennial, slightly tufted, blades 30-35 cm high, robust, glabrous. Florets elliptic, lemma upper part acuminate, awn only 1 mm long or absent, 4.2-5 x 1.2-1.4 mm. Surface slight membranous, lustrous, pale-greyish. Caryopses obovate, concavo-convex, apex hairy, 2.8-3.2 x 1-1.2 mm. Surface wrinkly slight lustrous, pale to dark-brown. Native to the Pyrenees and the Carpathians, sunny rocks of the montane zone. Ro.

**4388. *Festuca gigantea*** (L.) Vill., *Bromus giganteus* L. — Perennial, free tufted, blades arcuate-ascendent, 50-150 cm high, smooth. Florets elliptic, concavo-convex, compressed, apex gradually narrowed, awn faint hirsute, 6-6.6 x 1.4-1.6 mm. Surface fine hirsute. Caryopses cylindric, concavo-convex, apex rounded, bottom narrowed, with hilum, 4-4.3 x 1.1-1.3 mm. Surface lustreless, glabrous, reddish-brown.  $2n = 42$ . Native to Eurasia, leafy woods and

shrubberies, lowland forests on moister soils; in all Carpathian regions.

**4389. *Festuca guestphalica*** Boenn. ex Rchb., *F. lemanii* auct. non Bastard — Perennial, densely tufted, blades erect, 30-70 cm high, rough and downy above. Florets lanceolate, awn c. half of the lemma, 4-4.6 x 0.8-1 mm. Surface smooth, bare lustreless, yellowish-brown. Caryopses cylindric, concavo-convex, 2.4-2.8 x 0.6-0.7 mm. Surface glabrous, slight lustreless, reddish-brown.  $2n = 28$ . Native to Europe, rocky or stony slopes and pine-woods on drying up, mostly calcareous, sandy grounds. Sk.

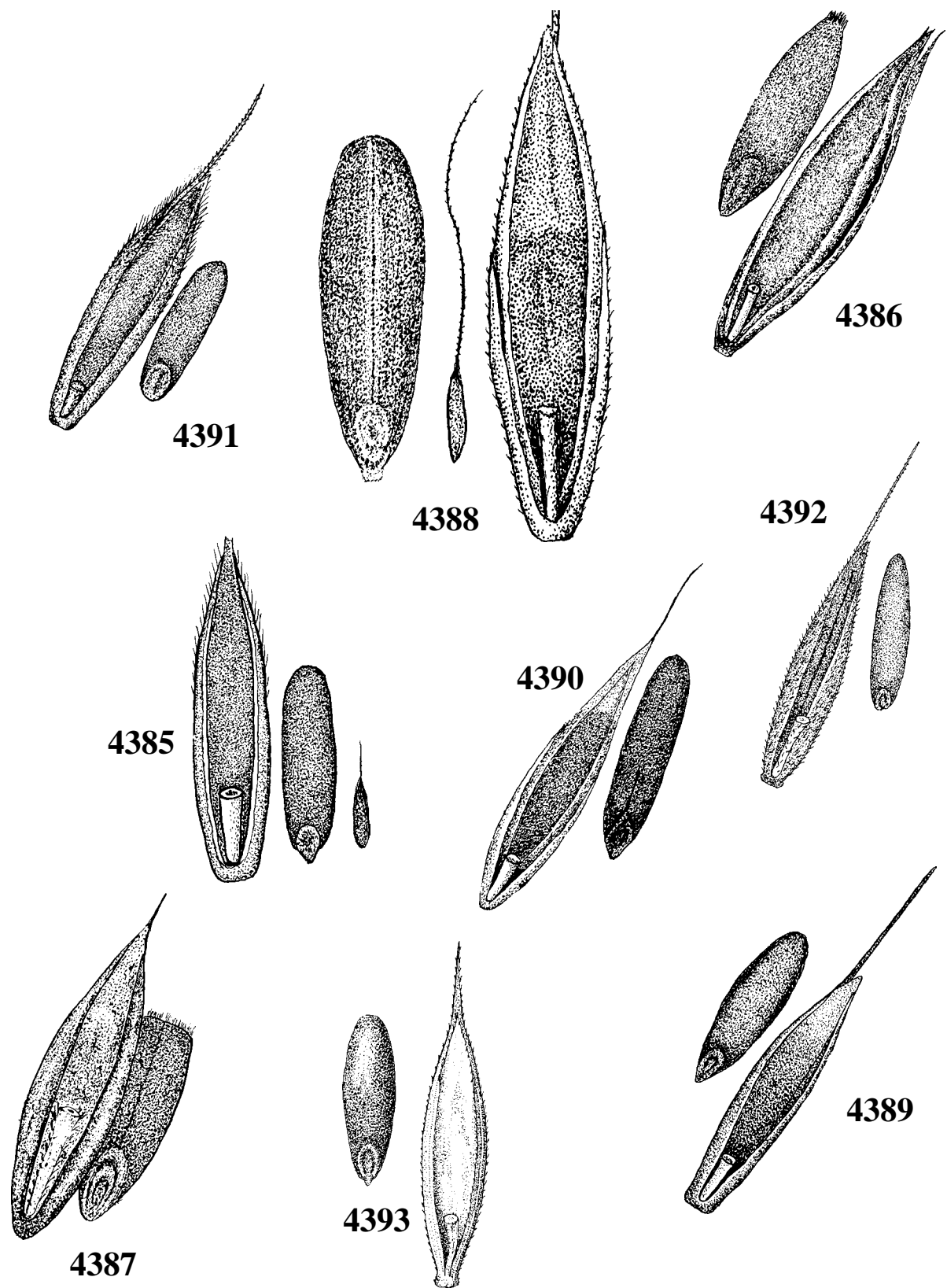
**4390. *Festuca heterophylla*** Lam. — Perennial, densely tufted, blades 60-120 cm high, feeble, with 3 nodules. Florets spindleshaped, lemma apex acuminate, with short awn (hardly half of the floret), 5-6 x 0.9-1.1 mm. Surface smooth, dirty straw-coloured. Caryopses cylindric, concavo-convex, ventral side longitudinal furrowed, apex roundish, bottom with hilum, 3.3-3.7 x 0.7-0.9 mm. Surface glabrous, slight lustrous, dark-brown.  $2n = 28$  (42?). Native to Europe, light leafy woods and shrubby slopes of lowland and upland zones. Hu, Pl, Ro, Sk, Uk.

**4391. *Festuca májovskyi*** Holub, *F. jávorkae* Májovský — Perennial, blades 40-80 cm high, rough under panicle, greyish glaucous. Florets lanceolate, flattish, lemma bare below, narrowed, dense ciliate above, awn c. 1/3 of the lemma, 4.2-4.8 x 0.9-1 mm. Surface hirsute, dirty-yellowish-brown. Caryopses cylindric, concavo-convex, 2.1-2.3 x 0.5-0.7 mm. Surface glabrous, slight lustrous, reddish-brown. Native to Europe, sandbanks in southern Slovakia. Sk.

**4392. *Festuca nigrescens*** Lam., *F. rubra* L. subsp. *commutata* (Gaud.) St.-Yves — Perennial, densely tufted, stems 30-90 cm high, nodules ascendent, bare, smooth. Florets (left) lanceolate, lemma apex awned, scarce hirsute, 5.4-6 x 1-1.2 mm. Surface dirty straw-coloured. Caryopses (right) cylindric, concavo-convex, apex round, bottom with hilum, 3.3-3.5 x 0.7-0.8 mm. Surface smooth, lustrous, dark-brown.  $2n = 28, 42$ . Native to Europe, wood edges, meadows and pastures, frequently occurring in subalpine and alpine zones. Ro, Sk.

**4393. *Festuca ovina*** L., *F. vulgaris* (W. D. J. Koch) Hayek — Perennial, densely tufted, blades erect, 20-70 cm high, thin, rough above. Florets lanceolate, flattish, awn 1/4-1/3 of the lemma, 4-5 x 0.8-1.2 mm.





Surface mostly bare, smooth, sometimes coarse or hirsute. Caryopses elliptic, concavo-convex, 2.8-3.2 x 0.8-1 mm. Surface smooth, slight lustrous, brown or reddish-brown.  $2n = 14$  (21, 28, 35, 42, 49, 56, 70). Native to Euro-Siberia, light woods, forest edges, pastures, sandbanks, poor non-calcareous soils. Br, Hu, Pl, Ro, Sk, Uk.

**4394. *Festuca pallens*** Host, *F. duriuscula* L. em Poll. — Perennial, free, densely tufted, blades erect, 30-60 cm high, smooth, rough only above. Florets spindle-shaped, upper part narrowed, acuminate, awn as much as half of the lemma or shorter, 4.2-4.8 x 0.9-1.1 mm. Surface smooth. Caryopses cylindric, concavo-convex, 3.3-3.7 x 0.8-0.9 mm. Surface glabrous, lustreless, reddish-brown.  $2n = 14, 28$ . Native to Europe, stony and rocky slopes, sunny, mostly calcareous or neutral grounds. Au, Hu, Pl, Ro, Sk, Uk.

**4395. *Festuca paniculata*** (L.) Schinz. et Thell, *F. aurea* Lam., *F. spadicea* L. — Perennial, stems with tuberous base, 50-100 cm high, caespitose, panicle lax at anthesis, branches glabrous or scabrid. Florets  $\pm$  spindle-shaped, lemma 5-veinous + 2 marginal veins, palea a little shorter than the lemma, 6-8 x 1.8-2.1 mm. Caryopses spindle-shaped, planoconvex, 4-5 x 1.8-2 mm. Surface lustrous, dark-brown. Native to southern Europe, mountain, rocky grounds, dry grasslands. Ro.

**4396. *Festuca picturata*** G. Pils, *F. picta* Kit. et Schult. — Perennial, densely or free tufted, stems erect, 25-40 cm high, bluntly angular, downy beneath panicle. Florets lanceolate, flattish, apex acuminate and with short hirsute awn, 4.2-4.8 x 0.9-1.1 mm. Surface smooth, slight lustrous, pinkish straw-coloured. Caryopses cylindric, concavo-convex, 2.4-2.8 x 0.7-0.8 mm. Surface smooth, slight lustrous, pinkish-brown.  $2n = 14$ . Native to the Alps and the Carpathians, mountain meadows, overgrown screes, dwarf pine areas of the alpine zone. Pl, Ro, Sk, Uk.

**4397. *Festuca polesica*** Zapal., *F. quercetopinetorum* Klokov — Perennial, densely caespitose, stems 20-60 cm high, scabrid-puberulent or densely hairy above, panicle 4.5-10.5 cm, branches scabrid. Florets oblong-lanceolate, apex acuminate, awn 1-2 mm high, 4-4.6 x 0.8-1 mm. Surface scabrid above. Caryopses cylindric, concavo-convex, bottom narrowed, 2.2-2.5 x 0.6-0.8 mm. Surface faint lustrous,

brown.  $2n = 14$ . Native to northern and eastern Europe, grassless sands, pine-woods and riverbanks. Br, Uk.

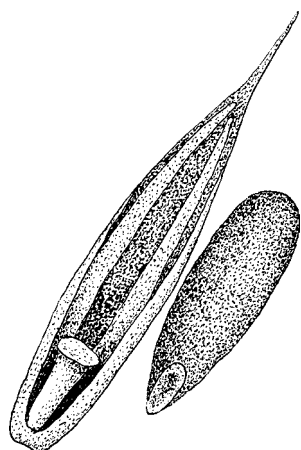
**4398. *Festuca porcii*** Hack. — Perennial, laxly caespitose, stems up to 100 cm high, non-flowering shoots extravaginal, panicle lax, 13-18 cm, branches rather long-setose. Florets obovate, obtuse or very short acuminate, 6-7 x 1.3-1.5 mm. Caryopses cylindric, concavo-convex, narrowed below into hilum, 3.5-4 x 1.1-1.3 mm. Surface longitudinal fine furrowed, faint lustrous, dark-brown.  $2n = 14$ . Native to the South-East Carpathians, calcicole, mountain meadows. Pl, Ro, Sk, Uk.

**4399. *Festuca pratensis*** Huds. — Perennial, free tufted, blades 30-70 cm high, arcuate-ascending up to erect, smooth. Florets lanceolate or obovate, compressed, apex gradually narrowed, awnless, 6.5-7.5 x 1.4-1.6 mm. Surface smooth, straw-coloured. Caryopses cylindric, concavo-convex, 3.8-4.2 x 1.3-1.5 mm. Surface faint wrinkly, slight lustrous, reddish-brown.  $2n = 14, 28$ . Native to Eurasia, meadows, pastures, boundaries, roads, embankments, ditches; throughout the Carpathians, often sown and grown on meadows.

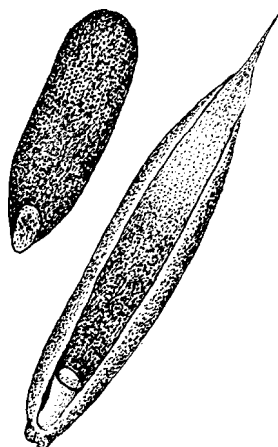
**4400. *Festuca psammophila*** (Hackel ex Čelak.) Fritsch — Perennial, stems 20-57 cm high, glabrous, panicle 9-12 cm, branches glabrous or scabrous. Florets oblong-lanceolate, acuminate, very short hairy, lemma oblong-ovate, acuminate, awn up to 1/4 as long as the lemma, 3.7-4.3 x 0.7-0.9 mm. Caryopses cylindric, concavo-convex, 2.3-2.6 x 0.6-0.8 mm. Surface longitudinal fine furrowed, lustrous, reddish-brown.  $2n = 14$ . Native to central Europe, sandy soils. Cz, Pl.

**4401. *Festuca pseudodalmatica*** Krajina ex Domin — Perennial, densely tufted, blades 30-60 cm high, rough above, violetish. Florets (right) oblong-lanceolate or ellipsoid, lemma subulate-lanceolate, 4.4-4.8 x 0.6-0.8 mm. Surface scarce hirsute or smooth, coarse or hairy above, dull, greyish-straw. Caryopses (left) cylindric, concavo-convex, 2.4-2.6 x 0.6-0.7 mm. Surface glabrous, pale-brown.  $2n = 28$ . Native to Eurasia, sunny rocks and screes, stony and rocky steppes, dry and warmed up grounds. Hu, Ro, Sk, Uk.

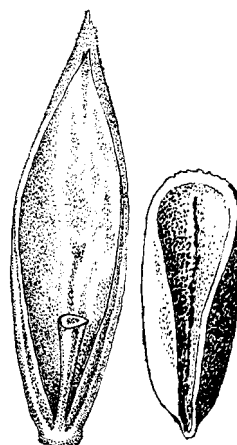
**4402. *Festuca pseudovina*** (Hack. ex Wiesb.) Nyman, *F. pulchra* Schur — Perennial, stiffly and densely tufted, blades erect, 10-30 cm high, smooth



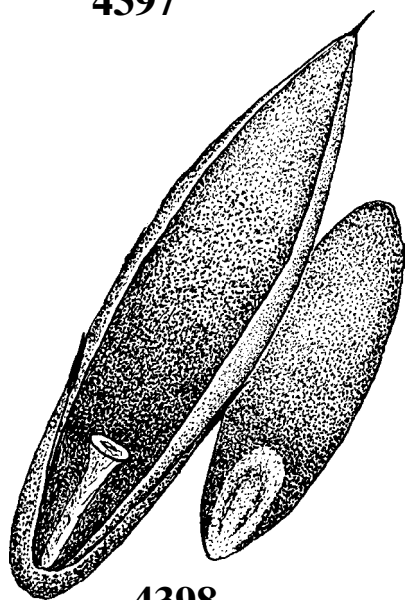
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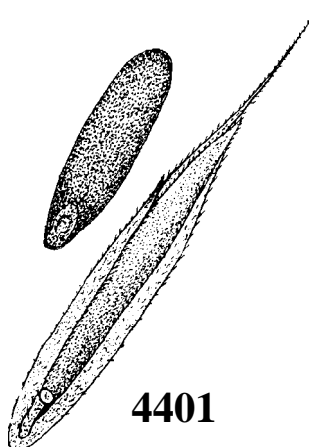
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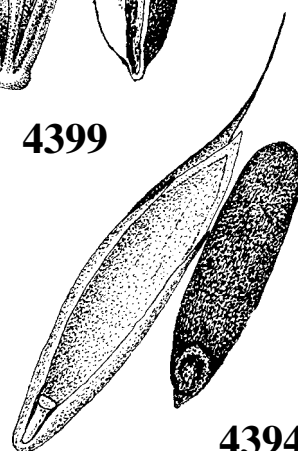
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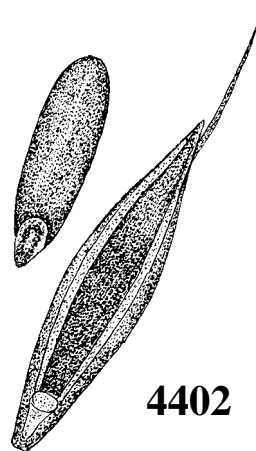
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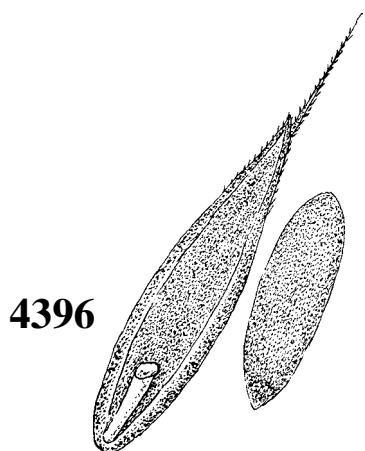
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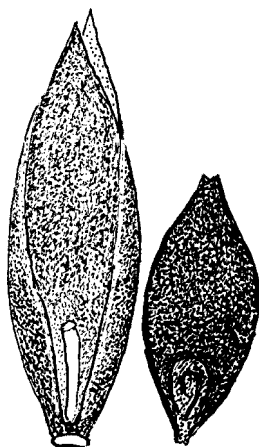
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or slightly rough. Florets spindleshaped, concavo-convex, compressed, awn smaller than 1/3 of the lemma, 3-3.5 x 0.5-0.7 mm. Surface smooth or faint downy, violetish-straw. Caryopses cylindric, concavo-convex, 1.7-1.9 x 0.5-0.6 mm. Surface glabrous, slight lustrous, reddish-brown.  $2n = 14$  (48). Native to Eurasia, dry, sandy and saline pastures and meadows, grassy and stony slopes, boundaries. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4403. *Festuca pumila*** Vill., *F. quadriflora* Honckeney – Perennial, stems 10-30 cm high, scabrous below the panicle, panicle 2-4 cm, lax, erect, with few spikelets, branches scabrous. Florets  $\pm$  obovate, concavo-convex, apex short awned, lemma lanceolate, acuminate, with a hilumous margin above, awn very short (c. 1 mm), 4.2-5 x 0.9-1.1 mm. Caryopses cylindric, concavo-convex, apex hairy, bottom narrowed with hilum, 2.5-3 x 0.7-0.9 mm. Surface lustreless, yellowish.  $2n = 14$ . Native to mountains of Europe, on rocks, screes and stony calcicole pastures. Ro.

**4404. *Festuca rubra*** L., *F. unifaria* Dumort. – Perennial, tufted, stems erect, 20-100 cm high, smooth, bare, leaf sheaths smooth or hirsute, reddish. Florets lanceolate, apex acuminate with hirsute awn c. 1/3 of the caryopsis, 5.5-6.5 x 0.8-1.2 mm. Surface bare or scarce hirsute, grayish. Caryopses cylindric, bottom narrowed with hilum, 3-3.6 x 0.7-0.8 mm. Surface smooth, lustreless, pale- to dark-brown.  $2n = (56)$ . Native to circumpolar territories, meadows, pastures, boundaries, dry light woods, sandbanks, embankments. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4405. *Festuca rupicola*** Heuff., *F. sulcata* (Hack.) Nyman, *F. hirsuta* Host – Perennial, densely tufted, blades erect, 20-50 cm high, angular and rough below panicle. Florets spindleshaped or lanceolate, compressed, apex with awn, 4.3-4.7 x 0.8-1.1 mm. Surface lower part bare, upper part or the whole surface with short hirsute up to ciliate awn, straw-coloured. Caryopses cylindric, concavo-convex, 2.4-2.7 x 0.7-0.8 mm. Surface glabrous, lustreless, dark-brown.  $2n = (14, 28) 42$ . Native to Eurasia, pastures, dry meadows, steppe and stony hills, boundaries, light woods and shrubberies. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4406. *Festuca scoparia*** (Kern. et Hack.) Nym., *F. lutea* K. Richt. – Perennial, scarcely tufted, blades, erect, 25-40 cm high, strong, glabrous. Florets (right) spindleshaped or lanceolate, apex acuminate with

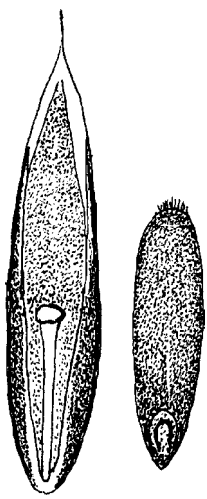
very short (less than 1 mm) and short hirsute awn, 5-5.5 x 1.2-1.5 mm. Surface mostly glabrous. Caryopses (left) elliptic, concavo-convex, apex hairy, 3.2-3.6 x 1-1.2 mm. Surface slight wrinkly, lustreless, brown. Native to the South-East Carpathians and the Pyrenees, calcareous, rocky and sunny areas of the montane zone. Ro.

**4407. *Festuca stricta*** Host – Perennial, densely tufted, leaf sheaths mostly densely tomentose, blades 30-40 cm high, scabrous above. Florets lanceolate, apex acuminate, scabrous,  $\pm$  ciliate or downy, awn shorter than half of the lemma, 3.8-4.2 x 0.9-1.1 mm. Caryopses cylindric, concavo-convex, 2.5-3 x 0.8-0.9 mm. Surface glabrous, slight lustrous, pale- or dark-brown.  $2n = 42$ . Native to Europe, sunny, calcite rocks and pine-woods. Hu, Ro, Sk.

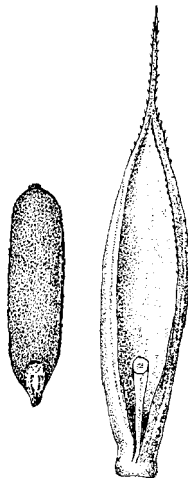
**4408. *Festuca supina*** Schur, *F. airoides* Lamk. – Perennial, densely tufted, blades 10-30 cm high, stiff, 4-angular, downy or weakly rough above. Florets lanceolate, smooth, awn shorter than half of the lemma, 4-4.5 x 0.8-1 mm. Caryopses cylindric, concavo-convex, 2.1-2.4 x 0.7-0.8 mm. Surface glabrous, lustreless, reddish-brown.  $2n = 28$ . Native to Eurasia, mountain meadows, rocks and screes on drying up, poor, non-calcareous grounds. Pl, Ro, Sk, Uk.

**4409. *Festuca tatarae*** (Czakó) Degen – Perennial, densely tufted, blades erect, rough, 30-75 cm high, with 2 nodules. Florets spindleshaped, flattish, apex narrowed acuminate, awnless, 4.3-5 x 0.9-1.1 mm. Surface scarce faint hirsute at top and bottom. Caryopses cylindric, concavo-convex, apex rounded, bottom narrowed with hilum, 2.4-2.8 x 0.8-0.9 mm. Surface glabrous, slight lustrous, dirty-yellowish.  $2n = 14$ . Native to the Carpathians, overgrown calcite and dolomite rocks of the alpine zone. Pl, Ro, Sk.

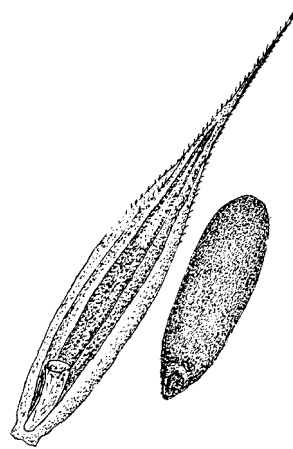
**4410. *Festuca tenuifolia*** Sibth., *F. filiformis* Pourr. – Perennial, densely tufted, blades 10-40 cm high, panicle scabrous below. Florets lanceolate, apex acuminate, awnless, 3-3.4 x 0.6-0.7 mm. Surface glabrous, pale-brown. Caryopses cylindric, concavo-convex, 1.6-1.8 x 0.5-0.6 mm. Surface glabrous, lustreless to dark-brown.  $2n = 14, 28$ . Native to central Europe, lawn and wood margins, cut-over areas, sandbanks, sunny slopes of upland and montane zones. Ro, Uk.



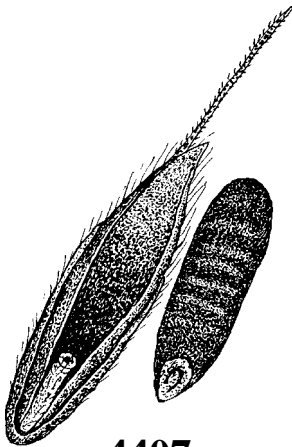
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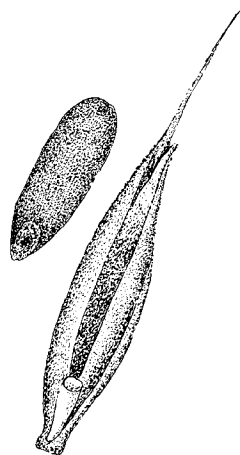
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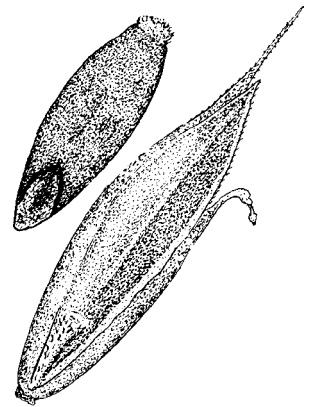
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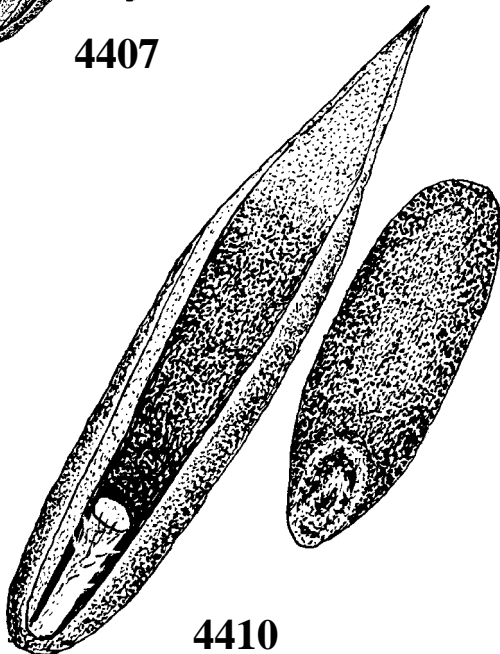
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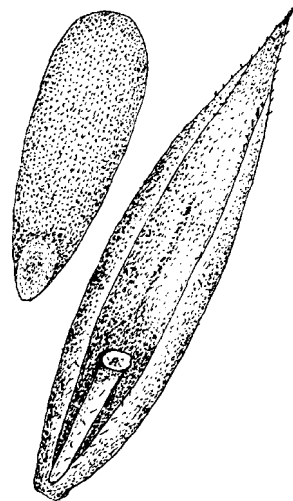
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**4411. *Festuca trachyphylla*** (Hackel) Krajina – Perennial, tufted, blades 30-75 cm high, rough above. **Florets oblong-lanceolate, apex acuminate, awn dense hirsute, 4.3-4.9 x 0.7-0.8 mm. Surface dense hirsute. Caryopses cylindric, concavo-convex, 2.3-2.5 x 0.6-0.7 mm. Surface glabrous, slight lustrous, reddish-brown. 2n = 42.** Native to Europe, sunny slopes and overgrown rocks, sandy pine-woods. Ro, Uk.

**4412. *Festuca trichophylla*** (Ducros ex Gaud.) K. Richt., *F. uliginosa* (Schur) Fritsch – Perennial, loosely tufted, stems 30-70 cm high, thin, leafy sheaths bare, smooth, pinkish. **Florets lanceolate, flattish, lemma short awned, 4.8-5.6 x 0.8-1 mm. Whole surface or its part hirsute. Caryopses cylindric, concavo-convex, 2.6-3 x 0.7-0.8 mm. Surface mostly sinuate, smooth, slight lustrous, dark-brown. 2n = 42.** Native to Europe, moist meadows and moorlands, basic and neutral grounds. Ro.

**4413. *Festuca vaginata*** Waldst. et Kit. ex Willd. – Perennial, densely tufted, slightly hoary, blades 25-60 cm high, bare, smooth, leaf sheaths very hoary. **Florets lanceolate, flattish, apex gradually narrowed, acuminate, with awn, 3.8-4.2 x 0.8-0.9 mm. Surface smooth, lustreless, yellowish-brown. Caryopses cylindric, concavo-convex, 2.1-2.3 x 0.7-0.8 mm. Surface glabrous, slightly lustrous, reddish-brown. 2n = 14.** Native to Eurasia, dry sandbanks, basic to neutral soils. Hu, Pl, Ro, Sk.

**4414. *Festuca valesiaca*** Schleich. ex Gaudin – Perennial, densely tufted, glaucous, blades erect, 20-50 cm high, thin, bare, slightly rough only above. **Florets oblong lanceolate, flattish, awn 0.5-2 mm long, fine hairy, 3.9-4.3 x 0.7-0.8 mm. Surface smooth or short hirsute, violetish-straw. Caryopses cylindric, concavo-convex, apex rounded, bottom narrowed with hilum, 2.3-2.5 x 0.6-0.7 mm. Surface glabrous, slight lustrous, reddish-brown. 2n = 14 (28, 42).** Native Eurasia, rocky, sandy and grassy steppes, forest steppes, on drying and warmed up grounds of warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**4415. *Festuca versicolor*** Tausch, *F. varia* auct. non Pers. – Perennial, densely and strongly tufted, blades 15-50 cm high, erect or ascendant,  $\pm$  stiff. **Florets elliptic, lemma in upper part narrowed without or with short awn, 4.5-5 x 1-1.3 mm. Surface short hirsute. Caryopses elliptic, concavo-convex, apex rounded, bottom narrowed with hilum, 2.7-3 x 0.9-1.1 mm. Surface wrinkly, slight**

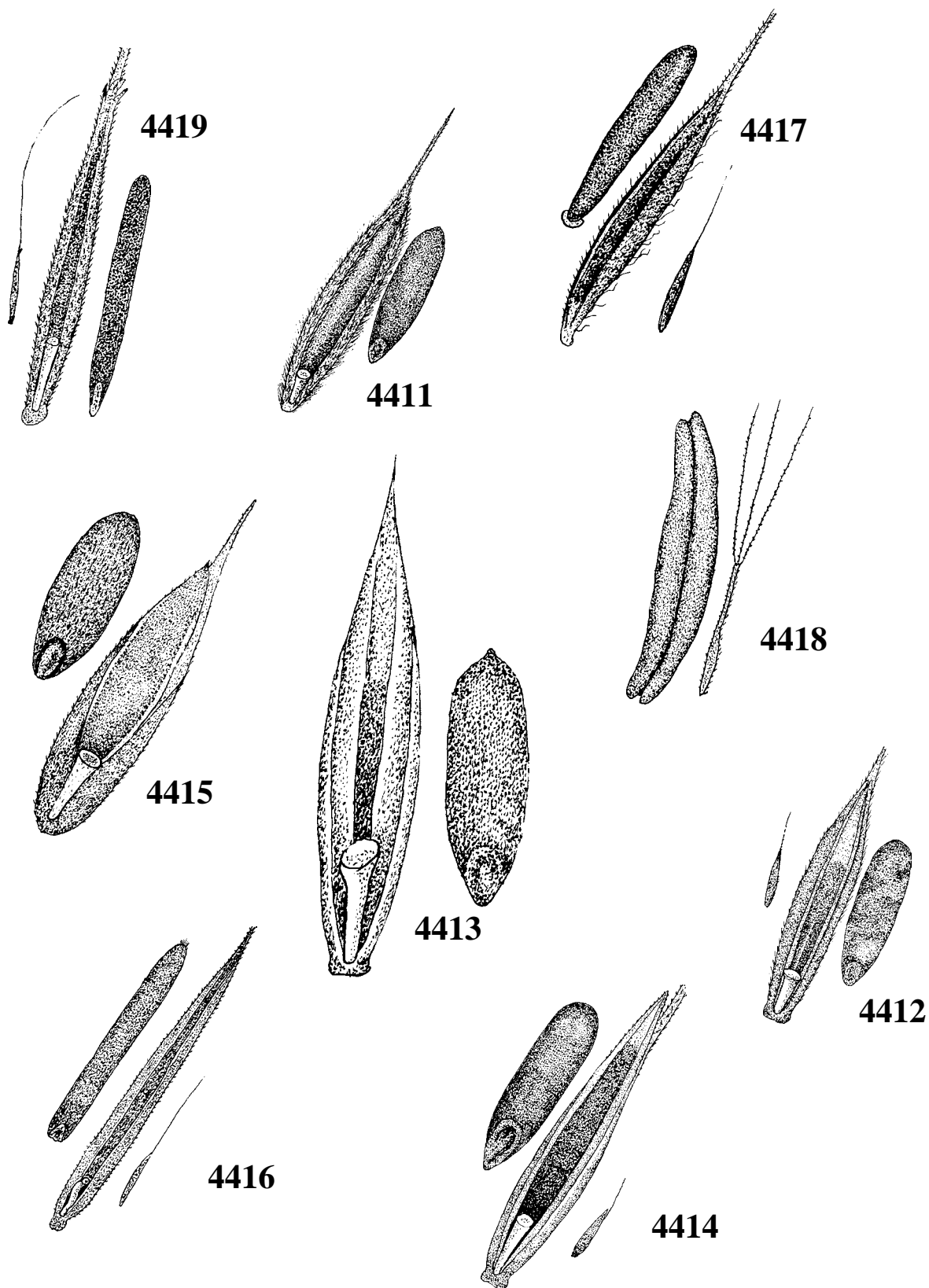
**lustrous, reddish-brown. 2n = 14.** Native to Europe, rocks and stony mountain meadows on limestone and basalt grounds of subalpine and alpine zones. Pl, Ro, Sk, Uk.

**4416. *Vulpia bromoides*** (L.) Gray, *V. dertonensis* All. – Annual to biennial, weakly tufted, blades 10-50 cm high, erect, lustrous. **Florets linear lanceolate, awn 1.5-2x longer than the floret, also short hirsute, 4.6-5.6 x 0.5-0.6 mm. Whole surface short hirsute. Caryopses oblong-cylindric, concavo-convex, apex hairy, 3.7-4 x 0.4-0.5 mm. Surface glabrous, lustreless, reddish-brown. 2n = 14.** Native to Europe, sandbanks, dryer, warmer, non-calcareous grounds of the upland zone in particular. Hu, Pl, Ro, Sk, Uk.

**4417. *Vulpia ciliata*** Dumort., *V. geniculata* (L.) Link – Perennial, annual to biennial, enough densely tufted, blades erect, 5-40 cm high, thin, glabrous, lower panicle rough. **Florets oblong-lanceolate, lemma short and fine hairy, 4-4.5 mm long, awn c. 1 cm long, 4.5-5.5 x 0.6-0.8 mm. Caryopses prolonged cylindric, convexo-concave, apex rounded, bottom slight narrowed, 3.3-3.7 x c. 0.5 mm. Surface smooth, violetish-brown. 2n = 28.** Native to the Mediterranean, rarely hauling into the Carpathians, waste grounds and raily-banks. Ro, Uk.

**4418. *Vulpia ligustica*** (All.) Link – Annual, tufted, blades 20-60 cm high, feeble, ascendent, leaf sheaths, bare and short. **Florets (right) prolonged, linear, awn 3-bristly, very short hirsute 7.5-10 x 0.1-0.2 mm. Surface very short hirsute or downy, thin, yellowish-brown. Caryopses (left) slight crooked with longitudinal furrow on ventral side, 2-2.3 x c. 0.5 mm. Surface smooth, lustreless, sandy-brown. 2n = 14.** Native to the Mediterranean, occasionally hauling into Carpathian dumps and railway stations.

**4419. *Vulpia myuros*** (L.) C. C. Gmel., *Festuca myuros* L. – Perennial, annual to biennial,  $\pm$  tufted, blades erect or ascendent, 20-50 cm high, smooth. **Florets oblong lanceolate, lemma 5-veinous, awn 1.5-2.5x longer than the caryopsis and short hirsute, 4.4-5 x c. 0.5 mm. Surface short hirsute. Caryopses oblong-cylindric, concavo-convex, 3.2-3.6 x c. 0.4 mm. Surface glabrous, reddish-brown. 2n = 14.** Native to Eurasia, grassy slopes, embankments, fallows, riverbanks, forest margins and sandbanks. Hu, Pl, Ro, Sk, Uk.



**4420. *Bellardiachloa violacea*** (Bellardi) Chiov., *Poa violacea* Bellardi — Perennial, densely tufted, blades rigid, erect or ascendent, 30-50 cm high, scabrous above. **Florets oblong-obovate, lemma obscure 5-veinous, palea ciliate, apex 2-dented, awn 1 mm long, 4.3-4.7 x 1-1.2 mm. Surface short and sparse hirsute at margins and back, violetish. Caryopses oblong-obovate, planoconvex, compressed, 1.8-2.1 x 0.6-0.8 mm. Surface fine waved, lustrous, yellowish, hilum dark-brown. 2n = 14.** Native to central and southern Europe and Asia Minor, grassy steppe slopes, screes, gravelly and weedy places of subalpine and alpine zones. Ro, Sk, Uk.

**4421. *Desmazeria rigida*** (L.) Tutin, *Poa rigida* L., *Scleropoa rigida* (L.) Griseb. — Perennial, blades at base tuftly ramified, procumbent, only apex ascendent or (rarely) erect, 10-50 cm high, smooth. **Florets prolonged obovate, margin slight membranous, apex gradually narrowed, awnless, bottom truncate, 2.3-2.6 x 0.6-0.8 mm. Caryopses obovate, concavo-convex, apex with hairy brushlet, 1.7-2 x 0.5-0.6 mm. Surface longitudinal faint striate, lustrous, reddish-brown. 2n = 14.** Native to western Europe and the Mediterranean, rarely hauling into the Carpathians. Ro (?).

**4422. *Poa alpina*** L. — Perennial, free tufted, blades erect or ascendent, 10-40 cm high, roundish, smooth, thin. **Florets elliptic, lemma indistinct 5-veinous, 3-3.5 x 0.9-1.1 mm. Surface keels and veins dense hirsute, slight woolly at base. Caryopses elliptic, planoconvex, apex hairy, 2.1-2.3 x 0.7-0.8 mm. Surface longitudinal faint striate, lustrous, reddish-brown. 2n = 22, 26, 28, 33-46 (21-74).** Native to circumpolar territories, high-mountain meadows, pastures, overgrown screes and rocky slits. Pl, Ro, Sk, Uk.

**4423. *Poa angustifolia*** L. — Perennial, tufts very dense, blades 50-70 cm high, panicle 2x as long as wide. **Florets elliptic, lemma hirsute, palea narrow 2-dentate, 2.3-2.6 x 0.5-0.9 mm. Caryopses elliptic, ± planoconvex, ventral side shallow furrowed, 0.9-1.1 x 0.3-0.4 mm. Surface longitudinal striate, slight lustrous, pale-brown, hilum darker. 2n = 28, 30, 46-62 (-72).** Native to circumpolar territories, dry steppe meadows, roads, dryer lawns, forest steppes, shrubby slopes and screes. Br, Hu, Mo, Ro, Sk, Uk.

**4424. *Poa annua*** L. — Annual to biennial, tufted, blades 5-30 cm high, weakly compressed, procumbent up to ascendent after flowering. **Florets ellip-**

**soid, compressed, lemma membranous broad marginate, indistinct 5-veinous, 3-3.5 x 0.9-1.1 mm. Caryopses planoconvex, upper part gradually narrowed, apex white-hairy, 2.1-2.3 x 0.7-0.8 mm. Surface longitudinal faint striate, reddish-brown. 2n = 28.** Native to Eurasia, fallows, roads, fields, waste places, gardens and moister soils; throughout the Carpathians.

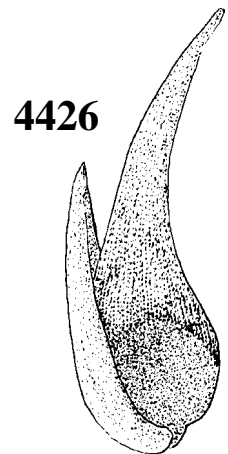
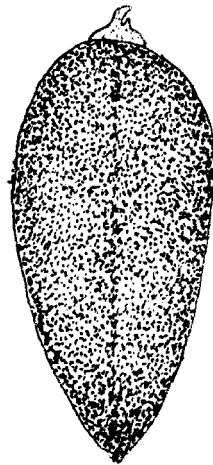
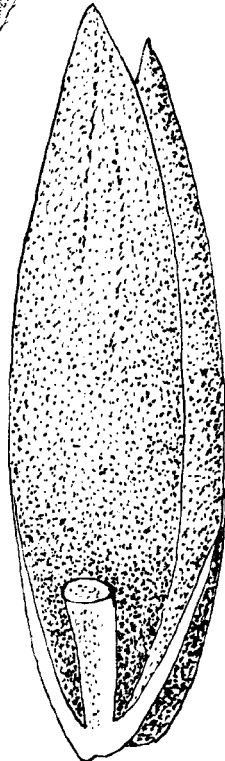
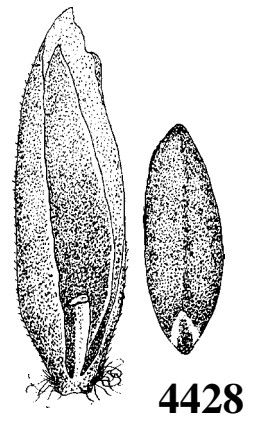
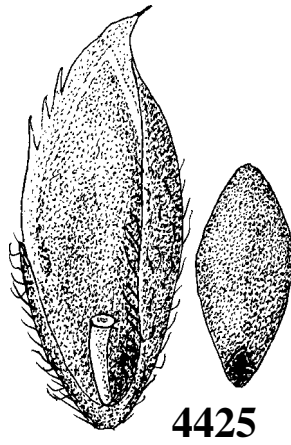
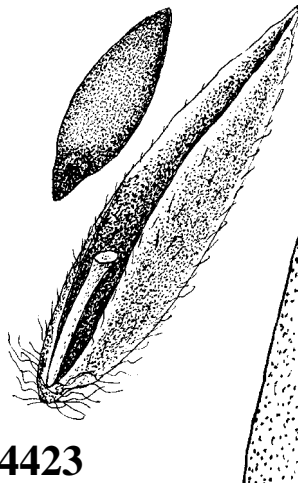
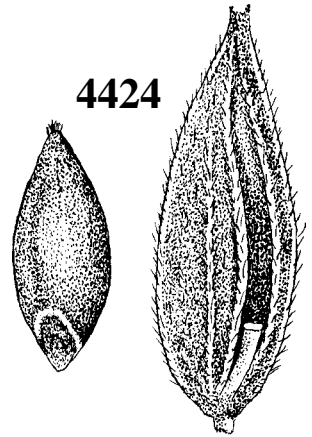
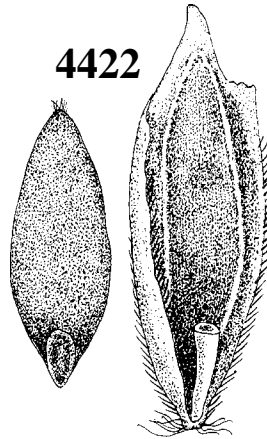
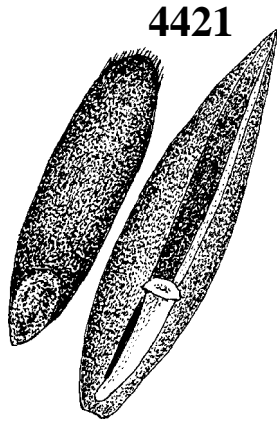
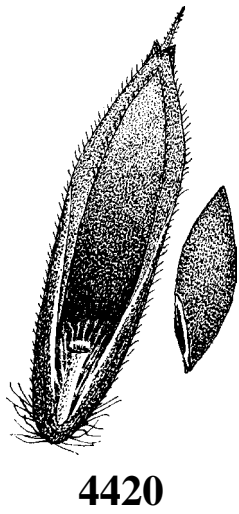
**4425. *Poa badensis*** Haenke ex Willd., *P. alpina* subsp. *badensis* (Haenke ex Willd) Nyman — Perennial, densely caespitose, stems 15-35 cm high, panicle 4-7 cm long, compact, ovoid. **Florets oblong-ovate, awnless, 3.3-3.7 x 0.8-1 mm. Surface lemma dense hairy, sparse hairy between the keel and marginal veins. Caryopses spindle-shaped, concavo-convex, trigonous, 1.4-1.6 x 0.6-0.7 mm. Surface fine wrinkly, glossy, reddish-brown. 2n = 14, 18, 28, 42.** Native to Europe, sunny, rocky and stony, often calcareous slopes. Hu, Ro, Sk.

**4426. *Poa bulbosa*** L. — Perennial, densely tufted, blades stiff and erect, 10-40 cm high, smooth, leafless above. **Florets lifebearing onionlets, prolonged-ovate, upper part gradually narrowed-acuminate, lemma oblong lanceolate, 2.5-4 x 1.1-1.3 mm. Surface indistinct 5-veinous, violetish. 2n = 28, 42.** Native to Eurasia, dry sunny clearings, fallows, slopes, forest steppes, roads, sandbanks, walls, saline soils in all Carpathian territories.

**4427. *Poa chaixii*** Vill., *P. sudetica* Haenke — Perennial, densely tufted, robust, blades erect, 50-150 cm high, compressed below. **Florets ellipsoid, lemma 5-veinous, awnless, 3.7-4.1 x 0.9-1.1 mm. Surface very short hirsute. Caryopses oblong-obovate, planoconvex, 1.9-2.1 x 0.7-0.9 mm. Surface longitudinal fine striate, slight lustrous, dark-brown. 2n = 14.** Native to Europe, mountain meadows, springheads, light humous woods and shrubberies. Pl, Ro, Sk, Uk.

**4428. *Poa compressa*** L. — Perennial, blades nodulose ascending, 20-40 cm high, smooth, compressed. **Florets (left) lanceolate, apex of lemma blunt, awnless, 2-2.4 x 0.5-0.7 mm. Surface bare or short depressed hirsute on keel and veins, slight woolly at base. Caryopses (right) elliptic, planoconvex, 1.2-1.4 x 0.4-0.5 mm. Surface longitudinal faint striate, lustrous, reddish-brown. 2n = 35, 42, 45, 49, 56.** Native to Europe, sunny slopes, rocks, screes, walls, light shrubberies, roads, basic or calcareous grounds throughout the Carpathians.





**4429. *Poa deylii*** Chrtek et Jirásek, *P. granitica* auct. non Braun-Blanq. — Perennial, 20-50 cm high, spikelets 5-9 mm long, lustrous, motley, yellowish-brown-violet. **Florets elliptic, lemma without visible veins, slight distinct rib, awnless, 3.3-3.7 x 0.9-1.1 mm. Caryopses oblong ovoid, dorsal side rooflike, convex, ventral concave, hilum small, 1.6-1.8 x c. 0.6 mm. Surface smooth, glossy, reddish-brown.** Native to the East Carpathians; rocks and stony slopes, mountain meadows in alpine and subalpine zones, rare. Uk.

**4430. *Poa granitica*** Braun-Blanq., *P. cenisia* auct. non All., *P. media* Haenke — Perennial, free tufted, blades thick, leafy up to panicle, 25-70 cm, erect, smooth. **Florets oblong, obovate, lemma 5-veinous, broad membranous bordered, 3.7-4.3 x 0.9-1 mm. Surface of lemma hirsute on keel and veins, long-woolly at base, internal palea fine hirsute. Caryopses spindleshaped, planoconvex, 3-angular, 2.1-2.3 x 0.6-0.7 mm. Surface longitudinal fine striated, slight lustrous, brown. 2n = 69-94.** Native to the West Carpathians, mountain meadows, overgrown moist screes and wet rocks. Pl, Ro, Sk.

**4431. *Poa laxa*** Haenke — Perennial, free-tufted, blades erect, with thin sheaths at base, erect, 10-20 cm high, thin, smooth, leafy below. **Florets oblong-ellipsoid, margins semimembranous, 3-3.4 x 0.8-0.9 mm. Surface of lemma on keel and veins below 2/3 hirsute, ciliate at base. Caryopses elliptic, planoconvex, 1.5-1.7 x 0.5-0.6 mm. Surface longitudinal faint striate, slight lustrous, brown. 2n = 28.** Native to Europe, wetting non-calcite rocks and screes, snow deck-chairs. Pl, Ro, Sk.

**4432. *Poa minor*** Gaud. — Perennial, densely caespitose, stems 5-30 cm high, leafy for most of their length, panicle 2-3 cm, ovoid, branches terete. **Florets lanceolate, lemma surface hairy for c. half of the length of the keel and marginal veins, apex acute and without awn, 3.2-3.8 x 0.8-1 mm. Surface lustreless, straw coloured. Caryopses ellipsoidal, planoconvex, 1.7-1.9 x 0.6-0.8 mm. Surface longitudinal striate, brown. 2n = 28.** Native to southern Europe, stony slopes and screes of the mountain zone. Ro.

**4433. *Poa molinerii*** Balb., *P. alpina* L. subsp. *xerophila* Br.-Bl. — Perennial, densely tufted, blades 10-18 cm high, with sheaths at base. **Florets oblong-ovoid, margins in upper part membranous, apiculate to very short awn, 3-3.5 x 0.9-1.1 mm. Surface**

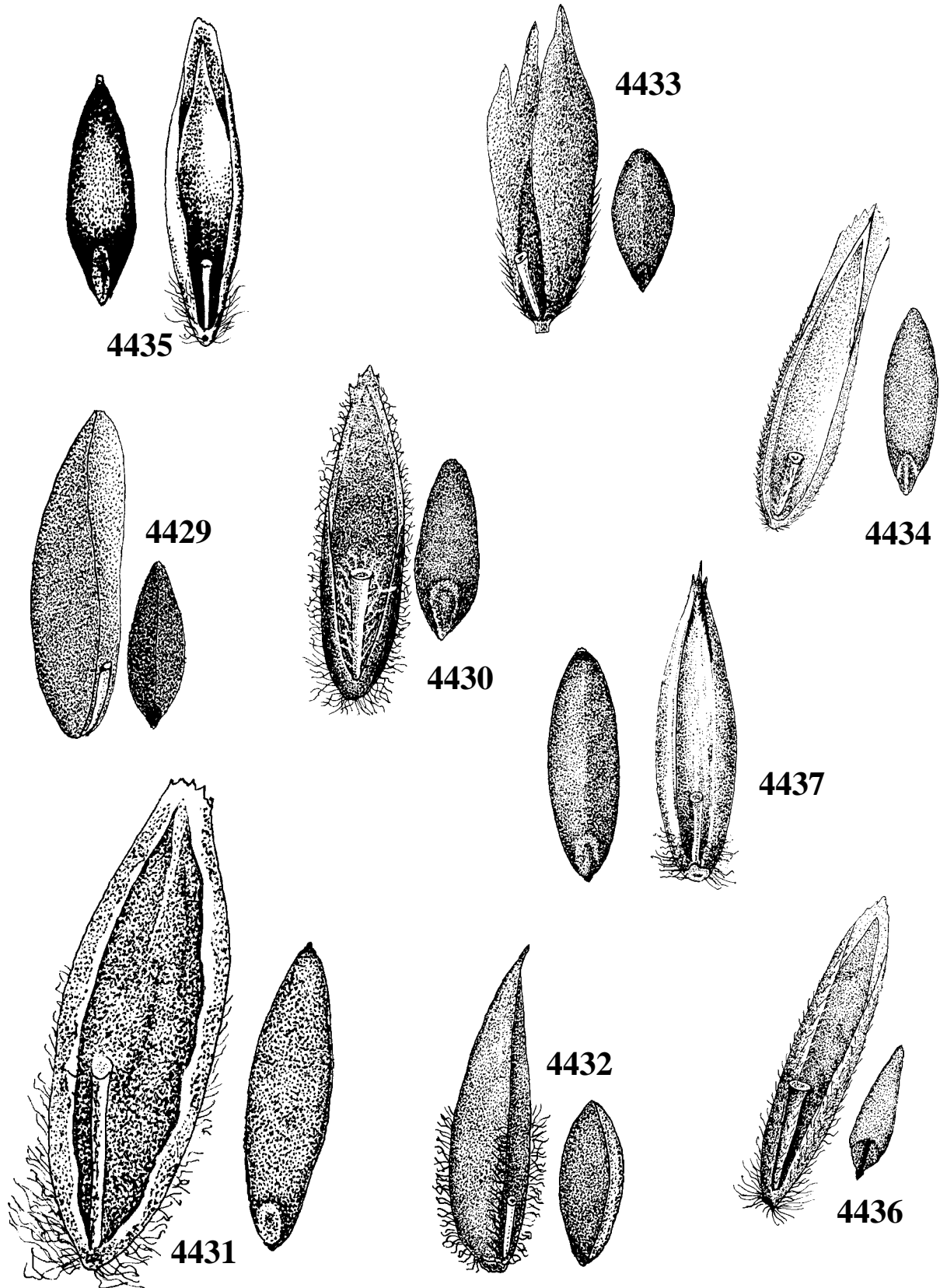
**of keel and veins hirsute. Caryopses elliptic, planoconvex, 1.2-1.4 x 0.5-0.7 mm. Surface dull or slight lustrous, brown. 2n = 14, 28.** Native to Europe, sunny and dry slopes, hills and mostly calcite rocks. Ro, Sk.

**4434. *Poa nemoralis*** L. — Perennial, densely and free-tufted, fertile blades shortly ascendent up to erect, 30-70 cm high, levelly leafy, smooth or slightly rough. **Florets (left) oblong elliptic, lemma indistinct 5-veinous, 2.8-3.2 x 0.6-0.8 mm. Surface of lemma in lower keel half and on border veins hirsute. Caryopses (right) slight planoconvex up to roundish, apex acuminate, 1.4-1.6 x 0.4-0.5 mm. Surface longitudinal striate, slight lustrous, reddish-brown. 2n = 42.** Native to circumpolar territories, light humous, leafy and mixed woods and shrubberies, overgrown rocks and slopes; in all Carpathian regions.

**4435. *Poa palustris*** L., *P. serotina* Ehrh., *P. fertilis* Host — Perennial, free-tufted, blades numerous, shortly ascendent, 40-100 cm high, smooth. **Florets oblong-elliptic, lemma indistinct 5-veinous, apex of lemma blunt, 2.4-2.8 x 0.5-0.6 mm. Surface of lemma hirsute in lower keel half and on veins, woolly at the base. Caryopses in transversal section ± roundish, 1.4-1.8 x 0.4-0.5 mm. Surface longitudinal striate, slight lustrous, reddish-brown. 2n = (21) 28 (29, 30, 32, 42).** Native to circumpolar territories, wet and boggy grasslands, marshes and forest margins, in all Carpathian territories.

**4436. *Poa pannonica*** A. Kern. subsp. *scabra* (Kit. ex Asch. et Graebn.) Soó — Perennial, densely tufted, blades shortly ascendent, 25-40 cm high, thin, upper half rough, with sheaths often compressed. **Florets oblong-lanceolate, lemma acuminate, indistinct 5-veinous, awnless, 3.4-3.8 x 0.6-0.7 mm. Surface of lemma in lower keel 3/4 hirsute, woolly hirsute at base. Caryopses oblong semipyramidal, ± planoconvex, 1.2-1.5 x 0.4-0.5 mm. Surface longitudinal faint striate, slight lustrous, reddish-brown. 2n = 42.** Native to Europe, sunny, rocky slopes in uplands, mostly on calcite or basic stands. Hu, Ro, Sk.

**4437. *Poa pratensis*** L., *P. complanata* Schur — Perennial, free-tufted, blades erect, 20-70 cm high, smooth, roundish, upper half often leafless. **Florets oblong-lanceolate, 5-veinous, 2.4-3.2 x 0.6-0.7 mm. Surface woolly at base, up to 2/3 of the keel hirsute. Caryopses spindleshaped, 3-angular, 1.5-2 x 0.5-0.6 mm. Surface longitudinal faint striate, lustreless, brown. 2n = 35, 40, 42, 50-**



**78, 91, 98.** Native to circumpolar territories, moist meadows, pastures, lawns, fields, light woods, forest margins, slopes, embankments and waste places; in all Carpathian regions.

**4438. *Poa remota*** Forselles, *P. sudetica* var. *remota* (Forselles) Fries — Perennial, free- and single-tufted, blades 50-150 cm high, leaf-sheath scabrous. **Florets oblong-lanceolate, slightly convex on back, 5-veinous, awnless, 3.5-3.9 x 0.6-0.8 mm. Surface of keel spiniferous, base woolly. Caryopses elliptic, planoconvex, shallow furrowed on ventral side, 1.8-2.1 x 0.5-0.6 mm. Surface longitudinal faint striate, slight lustrous, brown. 2n = 14.** Native to Eurasia, moist and shady woods, littoral shrubberies and brookbanks. Br, Pl, Ro, Sk, Uk.

**4439. *Poa stiriaca*** Fritsch et Hayek, *P. capillifolia* (Kalchbr.) Degen — Perennial, densely tufted, blades erect, 50-100 cm high, stiff, smooth. **Florets oblong-elliptic, margins glabrous, awnless, 2.8-3.2 x 0.6-0.7 mm. Surface of lemma scarce hirsute in lower half keel, base poor woolly. Caryopses elliptic, planoconvex, 3-angular, 1.4-1.6 x 0.4-0.5 mm. Surface longitudinal fine furrowed, slight lustrous, pale-brown. 2n = 14.** Native to Europe, light, leafy and mixed woods, grassy slopes. Pl, Ro, Sk.

**4440. *Poa subcaerulea*** Sm., *P. pratensis* L. subsp. *irrigata* (Lindm.) Lindm. fil. — Perennial, tuftless, blades 10-60 cm high, single with 1-2 nodules. **Florets oblong-spindleshaped, awnless, 3.2-3.8 x 0.7-0.9 mm. Surface of lemma long hirsute in lower half of keel and at base, palea short hirsute in above half. Caryopses elliptic, planoconvex, 1.7-2 x 0.5-0.6 mm. Surface longitudinal fine striate, slight lustrous, brown, hilum dark-brown. 2n = 82-147, usually 112-119.** Native to Europe, light woods, meadows, moist mountain pastures, riverbanks. Hu.

**4441. *Poa supina*** Schrad. — Perennial, blades 5-20 cm high, erect after flowering, panicle feeble. **Florets broad spindleshaped, lemma membranous marginate, apex awnless, 2.3-2.7 x 0.7-0.8 mm. Surface strawly-brown. Caryopses elliptic, 3-angular, planoconvex, 1.2-1.4 x 0.6-0.7 mm. Surface longitudinal faint striate, slight lustrous, dark-brown.** Native to Europe, grassy forest roads, moist pastures and springheads. Pl, Ro, Sk.

**4442. *Poa trivialis*** L. — Perennial, blades 30-90 cm high, erect, rarely ascendent below, smooth, roundish,

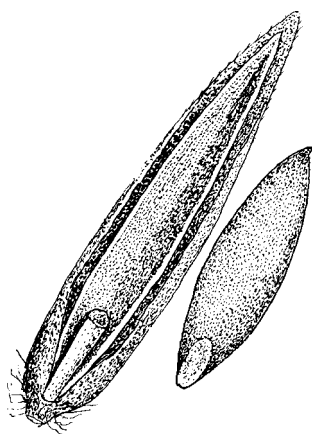
rough below panicle. **Florets oblong-lanceolate, 2-2.8 x 0.5-0.7 mm. Surface of lemma on keel short hirsute, at base woolly, awnless. Caryopses spindleshaped, 3-angular, planoconvex, 1.5-1.8 x 0.4-0.6 mm. Surface longitudinal faint striate, slight lustrous, pale-brown, hilum dark-brown. 2n = 14.** Native to Eurasia, moist meadows and pastures, fallows, riverbanks, forest margins, shrubberies and boundaries; in all Carpathian territories.

**4443. *Sclerochloa dura*** (L.) Beauv., *Poa dura* (L.) Scop., *Cynosurus durus* L. — Annual, tufted, procumbent, blades with ascendent apex, 5-20 cm high, leafy. **Florets prolonged-lanceolate, lemma on apex blunt, 5-veinous, membranous bordered, 4.5-5 x 1-1.3 mm. Caryopses spindleshaped, dorsal side rooflike, ventral convex, 2.5-2.8 x 0.7-0.9 mm. 2n = 14.** Native to Eurasia, saline grounds and roads. Hu, Mo, Pl, Ro, Sk, Uk.

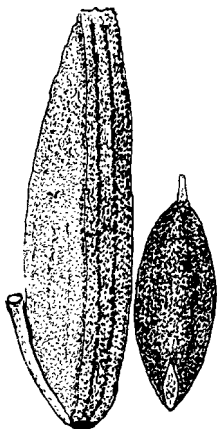
**4444. *Aeluropus littoralis*** (Gouan) Parl., *Poa littoralis* Gouan — Perennial, blades erect or ascendent, 20-60 cm high, glabrous, scabrous above, strongly ramified. **Florets oblong-ellipsoid, lemma 7(9)-veinous, short awned, 2.3-2.7 x 0.7-0.8 mm. Surface modest ciliate at base, internal surface very short and scarce hirsute, palea longitudinal striate. Caryopses obovoid, planoconvex, ventral side with longitudinal furrow, apex with 2 pale excrescences, bottom with large hilum, 0.9-1 x 0.5-0.6 mm. Surface longitudinal faint striate, brown.** Native to Eurasia, marine and continental saline sands. Mo, Ro.

**4445. *Puccinella distans*** (Jacq.) Parl., *Poa distans* Jacq. — Perennial, densely tufted, blades 10-50 cm high, ascendent to erect, numerous, smooth,  $\pm$  compressed. **Florets semiconic, apex narrowed, dentate, bottom truncate, lemma 5-veinous, slight hirsute, truncate at base, 1.8-2.2 x 0.6-0.8 mm. Caryopses ellipsoid, planoconvex, 1.5-1.7 x 0.5-0.6 mm. Surface longitudinal fine striate, slight lustrous, pale- to dark-brown. 2n = 42.** Native to Eurasia, saline grounds, rubbish heaps and sandbanks. Hu, Mo, Pl, Ro, Sk, Uk.

**4446. *Puccinella gigantea*** (Grossh.) Grossh., *P. festuciformis* Parl. subsp. *convoluta* W. E. Hughes — Perennial, blades erect, 10-70 cm high, tufted, panicle up to 20 cm high. **Florets (left) oblong-elliptic, lemma blunt, membranous at apex, 3-3.5 x 0.8-0.9 mm. Surface of lemma scarce hirsute at base, apex of palea hirsute. Caryopses (right)**

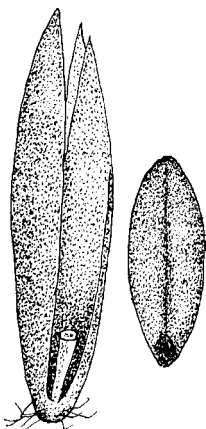
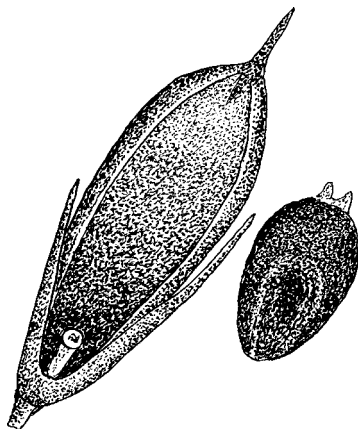


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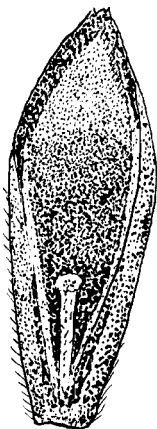


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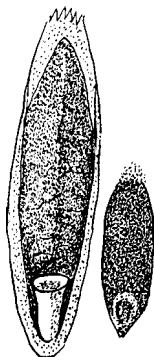


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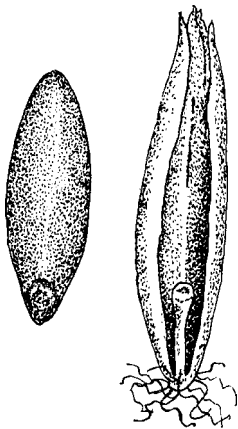
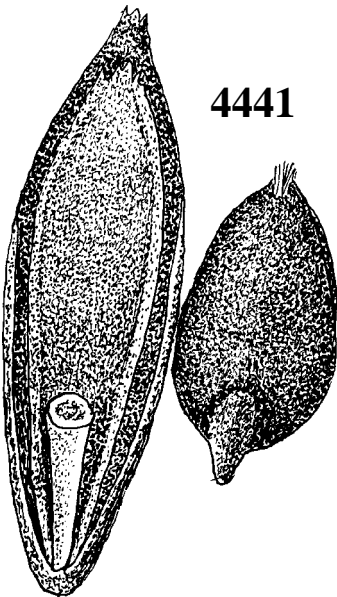


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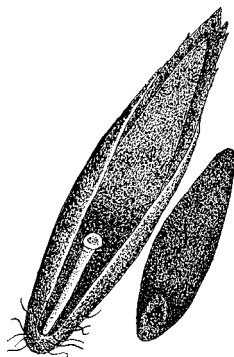


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elliptic planoconvex, apex round, hairy, bottom narrowed with hilum, 1.5-1.7 x 0.5-0.6 mm. Surface longitudinal striate, slight lustrous, reddish-brown. Native to Eurasia, saline grounds and rubbish heaps in the lowland zone; rarely hauling into the Carpathians. Mo, Ro, Uk.

**4447. *Puccinella limosa*** (Schur) Holmb., *Atropis distans* (L.) Griseb. — Perennial, blades erect, up to 60 cm high. Florets spindleshaped, lemma 5-veinous, with acuminate palea, scarce hirsute at bottom, 2-2.3 x 0.6-0.7 mm. Caryopses elliptic, dorsal and ventral sides convex, 1.4-1.6 x 0.5-0.6 mm. Surface longitudinal striate, glabrous, slight lustrous, brown.  $2n = 28$ . Native to Europe, moist in spring and dry in summer saline grounds. Hu, Mo, Ro, Sk (?).

**4448. *Puccinella maritima*** (Hudson) Parl., *Glyceria maritima* (Hudson) Wahlenb. — Perennial, robust, stems up to 30-80 cm high, erect or ascending. Florets semiconic, apex narrowed, usually dentate or semidentate, lemma with indistinct venation, without awn, 4-4.6 x 0.8-1.1 mm. Caryopses spindleshaped, 2-2.4 x 0.7-0.8 mm. Surface smooth, faint lustrous, dark-brown.  $2n = 56$  (14, 42, 49, 60, 63, 70, 77). Native to the coasts of western Europe and the Baltic region, salt-marshes. Pl.

**4449. *Glyceria declinata*** Bréb. — Perennial, free-tufted, blades stiff, erect, 80-200 cm high, to 10 mm in diam., smooth, sheaths slightly rough. Florets oblong-spindleshaped, lemma protrudent 7-veinous, coarse with narrow border, veins very short hirsute, 5-6 x 1.1-1.3 mm. Surface straw coloured. Caryopses cylindric, planoconvex, lateral side longitudinal furrowed, 2.5-2.7 x 1-1.2 mm. Surface glabrous, lustrous, dark reddish-brown.  $2n = 20$ . Native to Europe, forest roads and moorlands, moist fields. Ro, Sk.

**4450. *Glyceria fluitans*** (L.) R. Br., *Festuca fluitans* L. — Perennial, stems ascendent or crawling and rooting or swimming in water, 40-120 cm long. Florets oblong, protrudently 7-veinous, slight coarse, apex membranous, 5.5-6.5 x 1.4-1.6 mm. Caryopses cylindric, planoconvex, ventral side with longitudinal furrow, 2.5-2.9 x 0.9-1.4 mm. Surface lustrous, dark reddish-brown.  $2n = 40$ . Native to Europe, brookbanks, boundaries, spring-heads and light lowland woods, sometimes swimming in water; in all Carpathian regions.

**4451. *Glyceria lithuanica*** (Gorski) Gorski, *G. remota* Fries — Perennial, stems 50-150 cm high, leaves 4-9 mm wide, scabrous, flaccid. Florets oblong-ellipsoid, bottom part broader (in lateral view), 3.8-4.3 x 1-1.2 mm. Lemma surface smooth, lustreless, greenish or brownish-violet. Caryopses cylindric, 1.4-1.6 x 0.6-0.7 mm. Surface faint lustrous, longitudinal faint furrowed, brown. Native to north-eastern Europe, usually in wet woods. Br, Pl.

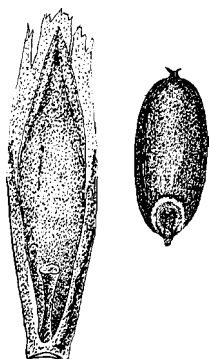
**4452. *Glyceria maxima*** (Hartm.) Holmb., *Poa aquatica* L. — Perennial, blades stiff, erect, 80-200 cm high, up to 10 mm in diam., smooth, sheaths of leaves slightly rough. Florets cylindric, 7-veinous on back, lemma on apex blunt, on margins membranous, 3.2-3.6 x 1-1.2 mm. Surface tuberculate or very short hirsute. Caryopses obovate, planoconvex, ventral side surface longitudinal striate, 1.7-1.9 x 0.9-1 mm. Surface lustrous, black.  $2n = 60$ . Native to circumpolar territories, banks of stagnant and slow-flowing waters, swamps, embankments and reeds; in all Carpathian territories.

**4453. *Glyceria notata*** Chevall., *G. plicata* (Fries) Fries — Perennial, blades ascendent, 40-80 cm high, robust, smooth, leaf sheaths slightly compressed. Florets obovoid, apex of lemma roundish, shallow crenate, broad membranous, protrudent 7-veinous, palea 2-dented, 3.5-4 x 1.2-1.8 mm. Caryopses short cylindric, planoconvex, ventral side longitudinal furrowed, 1.9-2.2 x 1-1.2 mm. Surface tuberculate, lustrous, dark-brown.  $2n = 40$ . Native to Eurasia, reeds, brookbanks, boundaries, spring-heads and meadow moorlands; throughout the Carpathians.

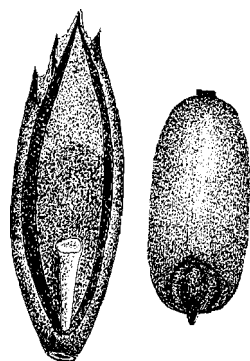
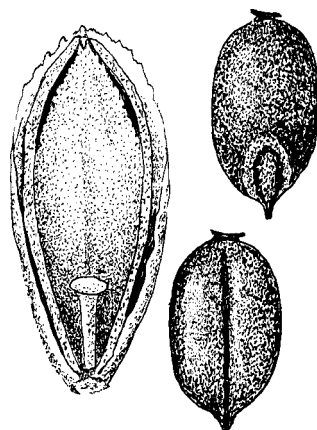
**4454. *Glyceria striata*** (Lam.) Hitchc., *G. nervata* (Willd.) Trin. — Perennial, stems 50-90 cm high, leaves 2-6 cm wide, acuminate. Florets ellipsoid, dorsal lemma 5-veinous, convex, ventral palea flat, with stronger border, 1.9-2.1 x 0.8-0.9 mm. Caryopses  $\pm$  spherical, planoconvex, 0.9-1 x 0.6-0.7 mm. Surface faint, longitudinal striate, lustrous, dark violet-brown. Native to North America, naturalized locally in various parts of the Carpathians. Uk.

**4455. *Briza maxima*** L., *B. major* Presl — Annual, blades 10-60 cm high, with 3-4 nodules. Florets broad obovoid, lemma belly-shaped, apex  $\pm$  truncate, slight acuminate, 6-8 x 4-6 mm. Caryopses obovoid, planoconvex, membranous, hem around all or around their upper part, 2.6-3.2 x 2-2.4 mm. Surface lustreless, pale-brown.  $2n = 14$ . Native to

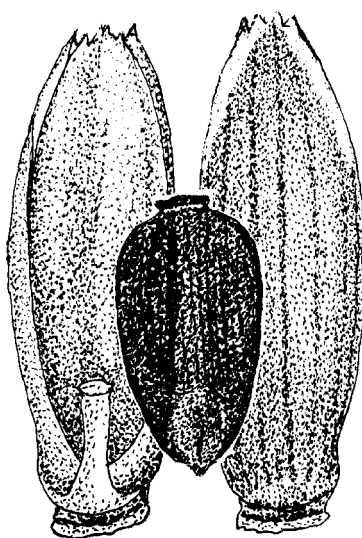
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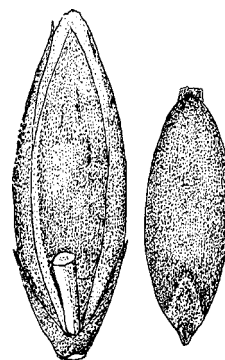
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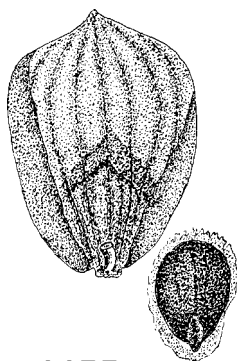
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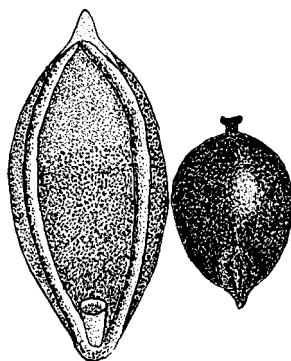
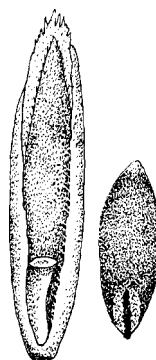


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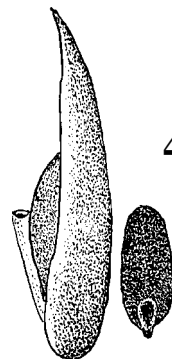


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4454



4451

southern Europe; in the Carpathians cultivated as an ornamental summer plant in gardens.

**4456. *Briza media* L., *B. tremula* Koeler** – Perennial, free-tufted, blades erect, 20-50 cm high, thin, smooth, with 2-3 nodules, sheaths of leaves closed, smooth. **Florets broad ovoid, lemma belly-shaped, apex blunt and fringed, clasping, 7-9 veinous, palea shorter than the lemma, 2.8-3.5 x 1.7-2 mm. Caryopses obovoid, planoconvex, apex roundish, bottom narrowed up to hilum, 1.2-1.5 x 0.8-1 mm. Surface striate, slight lustrous, yellowish-brown. 2n = 14, 28.** Native to Europe, meadows, pastures, forest clearings and margins; in all Carpathian territories.

**4457. *Briza minor* L.** – Annual, blades erect or ascendent, up to 30 cm high, sheaths bare, smooth, panicle broad, pyramidal. **Florets obconic, kettle-shaped, apex membranous, broad, bottom gradually narrowed, 1.8-2 x 1.6-1.8 mm. Surface glabrous, lustreless, straw-coloured. Caryopses obovoid, planoconvex, 0.9-1.1 x 0.7-0.8 mm. Surface faint striate, lustreless, yellowish-brown. 2n = 10.** Native to the Mediterranean; rarely hauling into the Carpathians.

**4458. *Dactylis glomerata* L., *Festuca glomerata* All.** – Perennial, densely tufted, blades 30-80 cm high, panicle erect, pyramidal, often one-sided. **Florets lanceolate, lemma mucronate, coarse, hirsute up to ciliate on back, 6.5-7.5 x 1.1-1.3 mm. Caryopses spindle-shaped, concavo-convex, 2.5-2.9 x 0.8-1 mm. Surface longitudinal faint striate or wrinkly, slight lustrous, pale-brown. 2n = 28.** Native to Eurasia, meadows, pastures, boundaries, shrubberies, cut-over areas and forest margins; in all Carpathian territories.

**4459. *Dactylis hispanica* Roth** – Perennial, low, gently tufted, blades 20-40 cm high, erect. **Florets lanceolate, lemma with short awn (c. 1 mm) or awnless, 3.5-4 x 0.9-1 mm. Surface very short hirsute. Caryopses ellipsoid, concavo-convex, 2.2-2.4 x 0.8-0.9 mm. Surface glabrous, lustreless, pale-brown. 2n = 28.** Native to the Mediterranean, sunny rocky steppes. Uk.

**4460. *Dactylis polygama* Horv., *D. flaccida* Čelak., *D. aschersoniana* Graebn.** – Perennial, loosely and poorly tufted, blades slender, ± roundish, ± smooth, ± feeble, panicle roughened only beneath. **Florets lanceolate, lemma thin, semitransparent, short-awned, back lower area bare, keel upper part and**

**awn hirsute, 4.7-5.3 x 0.7-0.8 mm. Caryopses ellipsoid, concavo-convex, 3-angular, 2.2-2.4 x 0.6-0.7 mm. Surface longitudinal faint striate, lustrous, yellowish-brown. 2n = 14.** Native to Europe, leafy humous woods, lowland forests and parks. Hu, Pl, Ro, Sk, Uk.

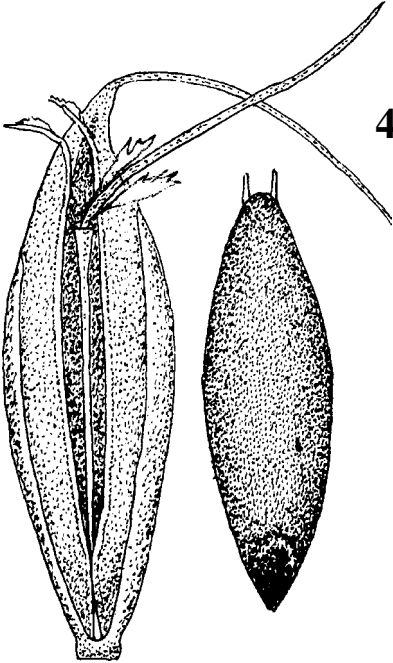
**4461. *Dactylis slovenica* Domin** – Perennial, very robust, densely tufted, blades 100-150 cm high, onion-like roughened at base, roundish, smooth. **Florets lanceolate, lemma at apex mucronate, on back coarse up to very short and faint hirsute, awn short (1 mm), 4.8-5.3 x 1-1.2 mm. Caryopses cylindric, concavo-convex, 2.1-2.3 x 0.7-0.8 mm. Surface faint waved, slight lustrous, pale-brown. 2n = 28.** Native to Europe, light woods and shrubberies, calcite and dolomite, habitats reaching as far as mountain meadows. Ro, Sk, Uk.

**4462. *Cynosurus cristatus* L.** – Perennial, densely tufted, blades stiff, erect, 20-90 cm high, sheaths of leaves smooth. **Florets lanceolate, indistinct veinous, awned, 3.1-3.7 x 0.6-0.8 mm. Surface whole back ± hirsute. Caryopses cylindric, concavo-convex, apex rounded, bottom narrowed into hilum, 1.8-2.2 x 0.5-0.7 mm. Surface glabrous, slight lustrous, brown. 2n = 14.** Native to Europe, dryer meadows, pastures, boundaries. Br, Hu, Mo, Pl, Ro, Sk, Uk.

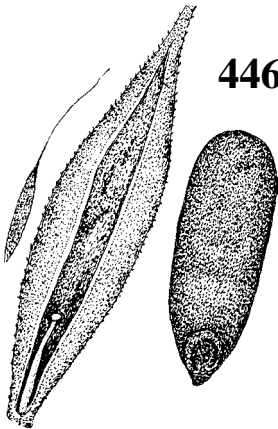
**4463. *Cynosurus echinatus* L., *Phalona echinata* (L.) Dumort.** – Annual, tufted, blades at base shortly ascendent, at nodules rooting down, erect, 20-60 cm high, thin, sheaths of leaves smooth. **Florets lanceolate or spindle-shaped, awns 10-15 mm long, 5-5.5 x 1.1-1.3 mm. Surface of lemma on back scabrous or short hirsute, more above than below. Caryopses oblong-cylindric, concavo-convex, 2.9-3.1 x 1-1.2 mm. Surface faint striate, slight lustrous, brown. 2n = 14.** Native to the Mediterranean, occasionally hauling into the Carpathians, on railway stations, depots and lawns. Hu, Mo, Ro, Sk, Uk.

**4464. *Lamarckia aurea* (L.) Moench., *Cynosurus aureus* L.** – Annual, tufted, blades 10-20 cm high. **Florets spindle-shaped, awn shorter than the caryopsis, rudiment of sterile flower longly awned with two membranous excrescences, 2.5-3 x 0.7-0.8 mm. Surface of lemma on back smooth, longitudinal faint striate. Caryopses ellipsoid, biconvex, ventral side with longitudinal furrow, 2-2.2 x 0.6-0.7 mm. Surface longitudinal faint striate, slight lustrous, greenish or greenish-brown. 2n = 14.** Native to the

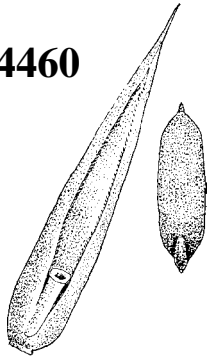




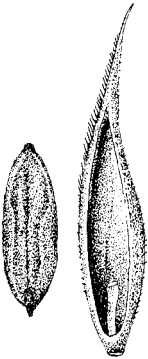
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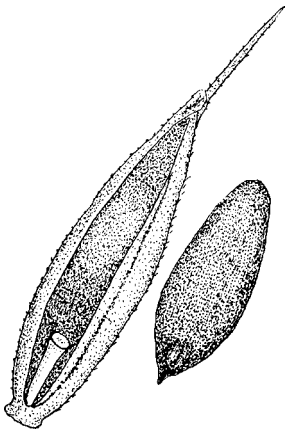
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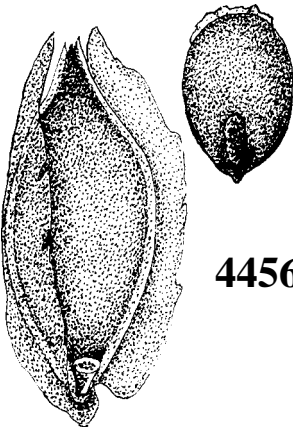
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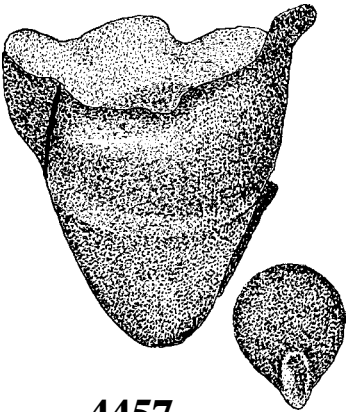
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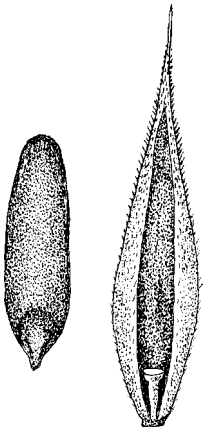
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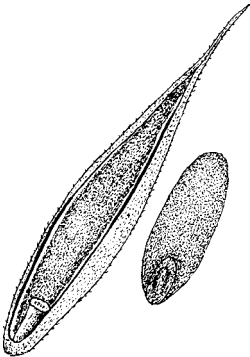
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4462



4461

Mediterranean; in the Carpathians rarely cultivated as an ornamental summer plant in gardens.

**4465. *Sesleria albicans*** Kit. ex Schult., *S. varia* Wettst. — Perennial, densely tufted, blades erect, 10-45 cm high, thin, sheaths of leaves bare. **Florets obovate-lanceolate, lemma ovate-lanceolate, scarce hairy at margins, 3-veinous, 1-5-dentate with awn c. 0.5 mm, palea 2-dentate, ciliate, 4.5-5 x 1.4-1.6 mm. Caryopses obovoid, apex round with beak, hairy, bottom gradually narrowed with hilum, 2.4-2.8 x 1.1-1.3 mm. Surface hirsute, dull, whitish-brown. 2n = 28.** Native to Europe, calcite, dolomite and slate rocks, stony steppes and light pine-woods. Hu, Pl, Sk.

**4466. *Sesleria caerulea*** (L.) Ard., *S. uliginosa* Opiz ex Bercht et Seidl — Perennial, densely tufted, blades ascendent or erect, 15-40 cm high, glabrous, striate, leafy. **Florets oblong-ellipsoid, lemma 5-veinous, 3-5 dentate with short awns, 4.5-5.5 x 1.1-1.5 mm. Surface of upper part hirsute. Caryopses elliptic, section rounded in transversal, apex with some hairs, 2.4-2.6 x 0.8-0.9 mm. Surface longitudinally striate, lustreless, brown. 2n = 28.** Native to the Carpathians and the Balkan mountains, sunny screes, or stony and grassy slopes of subalpine and alpine zones. Hu, Pl, Ro, Sk.

**4467. *Sesleria coerulans*** Friv., *S. orbelica* (Velen.) Hayek — Perennial, stems up to 25 cm high, stout, leaves 2-4 mm wide, glabrous, usually plicate, sheaths densely villous, inflorescence dense. **Florets oblong-ellipsoid, palea longer than the lemma, awns 1-2 mm, lemma 4.5-5 x 1-1.3 mm. Caryopses oblong-ovoid, bottom narrowed, apex slight hairy, 2.6-3 x 1-1.2 mm. Surface brown. 2n = 56.** Native to the mountains of the Balkan Peninsula and the South-East Carpathians; stony or grassy slopes, Ro, Uk.

**4468. *Sesleria heufleriana*** Schur — Perennial, densely or scarcely tufted, blades erect, 60-70 cm high, smooth, or rough in upper part. **Florets (left) oblong-ovoid, lemma 1-5-dentate and awned, palea 2-dentate, hirsute, 5-6 x 1.8-2.2 mm. Whole surface hirsute or downy. Caryopses (right) ellipsoid, transversal section roundish, ventral side indistinct longitudinal furrowed, apex hairy, 2.8-3 x 1.4-1.6 mm. Surface tuberculate, dull, brown. 2n = 28.** Native to Europe, sunny, shrubby and rocky slopes on calcareous grounds. Hu, Mo, Pl, Ro, Sk, Uk.

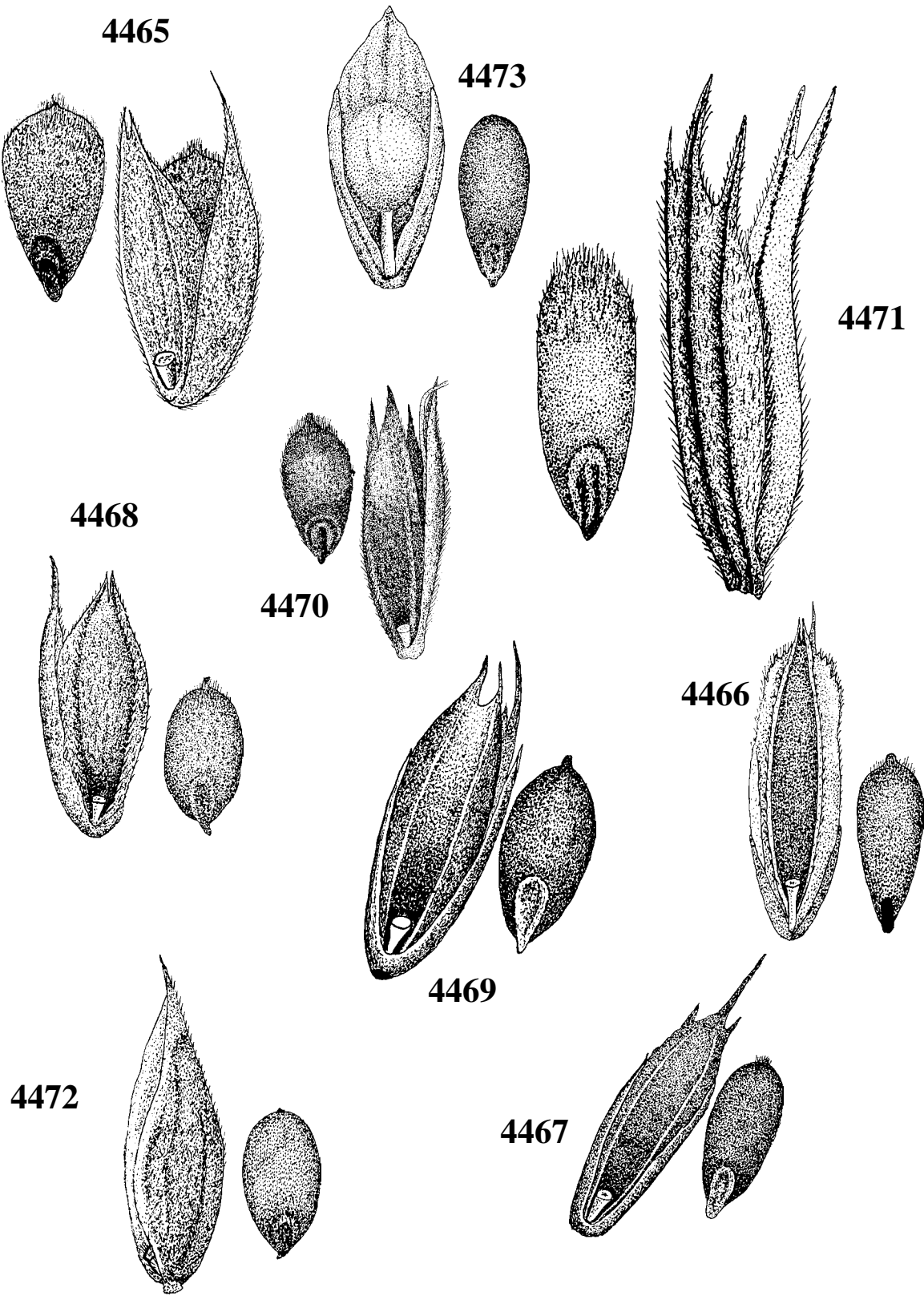
**4469. *Sesleria rigida*** Heuff. — Perennial, blades ascendent or erect, 8-50 cm high, glabrous, striate, with 2-4 leaves below. **Florets ellipsoid, lemma 3-5-dentate and short awned, veins, margins and rest area hirsute, palea as long as the lemma, two veins short hirsute, 3.9-4.5 x 1.3-1.5 mm. Caryopses ellipsoid, section roundish in transversal, apex with beak, bottom gradually narrowed with hilum, 2.3-2.7 x 1.1-1.3 mm. Surface tuberculate, wrinkly, lustreless, brown.** Native to the Carpathians and the Balkan mountains, grassy slopes, sunny and semishady rocky grounds of montane and alpine zones. Ro.

**4470. *Sesleria sadlerana*** Janka — Perennial, densely or freely tufted, blades stiff, 40-55 cm high, sheaths of leaves hirsute. **Florets oblong, lemma 3-5 dentate, with awnlets, borders and veins hirsute, area between the veins bare, palea hirsute, 5-5.5 x 1.5-1.7 mm. Caryopses obovoid, apex with beak, bottom gradually narrowed, with large hilum, 2.4-2.8 x 1.2-1.4 mm. Whole surface tight fitting, whitish hirsute. 2n = 56.** Native to Europe, calcite rocks. Au, Hu, Sk.

**4471. *Sesleria tatrae*** (Degen) Deyl, *S. bielzii* Schur subsp. *tatrae* (Degen) Domin — Perennial, free-tufted, blades robust, 30-50 cm high, lower part leafy, sheaths bare. **Florets oblong, lemma 3-5 veinous, 3-5-dentate, veins and edges hirsute, hirsute also between the veins, palea 2-dentate, 4.8-5.2 x 1.3-1.5 mm. Caryopses cylindric, convexo-convex, ventral side with longitudinal furrow, tight press at apex, 2.7-3.1 x 0.8-1 mm. Surface whitish hirsute, dark-brown. 2n = 56.** Native to the Alps and the Carpathian mountains, calcite, grassy and stony ridges of long-lastin snow-cover. Pl, Sk.

**4472. *Oreochloa disticha*** (Wulfen) Link, *Poa disticha* Wulfen — Perennial, densely tufted, blades erect, 6-25 cm high, stiff, thin, smooth, upper part downy. **Florets ovoid-lanceolate, 5-7-veinous, margins membranous, acuminate or short awned, 3.7-4.1 x 1.2-1.4 mm. Surface lower 2/3 short hirsute. Caryopses ellipsoid, planoconvex, ventral side longitudinal furrowed, apex round, bottom gradually narrowed into hilum, 1.8-2 x 0.9-1 mm. Surface slight lustrous, pale-brown. 2n = 14.** Native to the Alps and the Carpathians, mountain meadows and rocks on acid grounds. Pl, Ro, Sk, Uk.

**4473. *Melica altissima*** L. — Perennial, free-tufted, blades erect, 60-200 cm high, rough, nodular ascen-



dent below, sheaths of leaves rough. Florets ellipsoid, lemma ovoid, acuminate, distinct 9-13 veinous, margins broad membranous, 4.7-5.3 x 1.5-1.7 mm. Surface bare. Caryopses oblong-obovoid, concavo-convex, ventral side with longitudinal furrow, 2.7-3.1 x 1-1.2 mm. Surface smooth, longitudinal striate or coarse wrinkly, lustrous, reddish-brown.  $2n = 18$ . Native to Eurasia, light forests, shrubby slopes on calcareous soils. Hu, Mo, Pl, Ro, Sk, Uk.

**4474. *Melica ciliata*** L., *M. nebrodensis* Parl. — Perennial, tufted, blades erect, 20-70 cm high, thin, rough above, sheaths of leaves bare or scarcely downy. Florets prolonged ovoid, lemma lanceolate, acuminate, 5-7 x 1.4-1.6 mm. Surface of lemma long-haired. Caryopses ellipsoid or spindle-shaped, 2-2.2 x 0.9-1 mm. Surface longitudinal striate or smooth, strong lustrous, reddish-brown.  $2n = 18$ . Native to Europe, sunny shrubby slopes and rocks, screes, walls, on dry and warmer soils. Hu, Mo, Pl, Ro, Sk, Uk.

**4475. *Melica nutans*** L. — Perennial, tufts absent, blades erect, 20-60 cm high, thin, slightly rough above. Florets ellipsoid, biconvex with longitudinal furrow on ventral side, apex roundish with rest of the style, 2.8-3.2 x 1.4-1.6 mm. Caryopses, ellipsoid, bottom with hilum, 2.3-2.7 x 1.2-1.4 mm. Surface smooth, high lustrous, dark violetish-brown.  $2n = 18$ . Native to Eurasia, leafy woods and shrubberies, sand pine-woods; in all Carpathian territories.

**4476. *Melica picta*** C. Koch, *M. viridiflora* Čelak. — Perennial, densely tufted, blades 40-70 cm high, sheaths violet-coloured. Florets ellipsoid, apex acuminate, lemma indistinct 7-veinous, 5.2-5.6 x 2-2.4 mm. Surface smooth, lustrous, straw-yellow, apex slight violetish. Caryopses ellipsoid, concavo-convex, ventral side with indistinct, longitudinal furrow, 2.8-3.2 x 1.2-1.4 mm. Surface wrinkly, lustrous, dark-brown.  $2n = 18$ . Native to Europe, leafy woods and shrubberies, shrubby rocks on moist soils, warmed and drying up in summer. Hu, Mo, Pl, Ro, Sk, Uk.

**4477. *Melica transsilvanica*** Schur — Perennial, blades 30-90 cm high, with short leafy shoots, sheath of lower leaves shaggily hirsute. Florets ellipsoid, lemma broad membranous bordered, acuminate, 4-5 x 1.2-1.8 mm. Surface of lemma silky long-hair. Caryopses ellipsoid or spindle-shaped, concavo-convex, ventral side with indistinct longitudinal

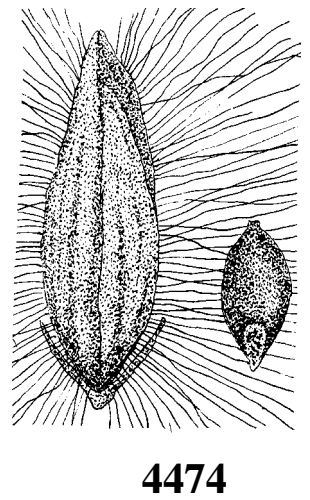
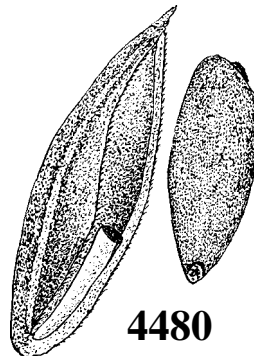
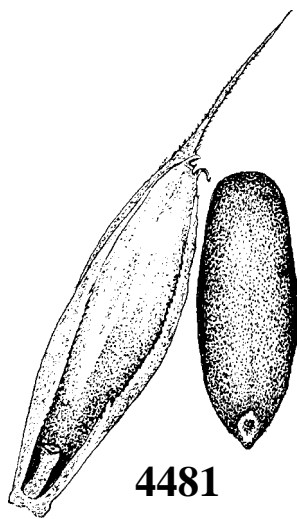
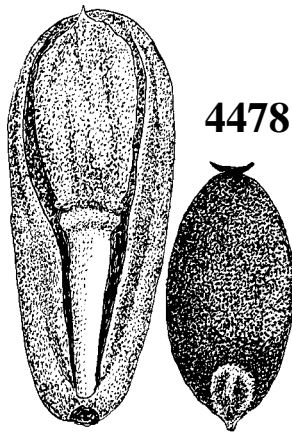
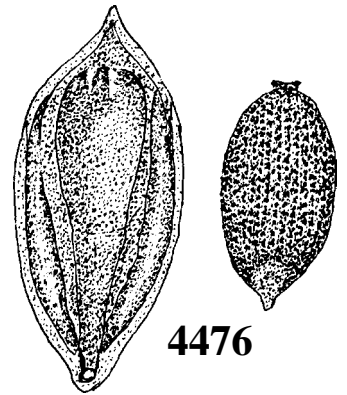
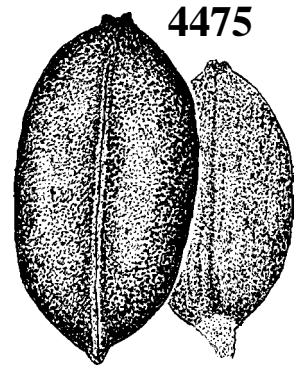
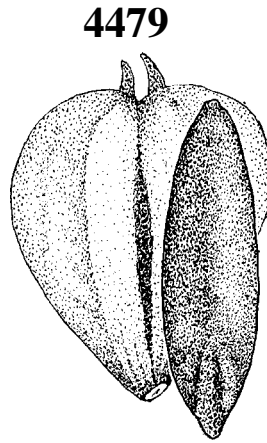
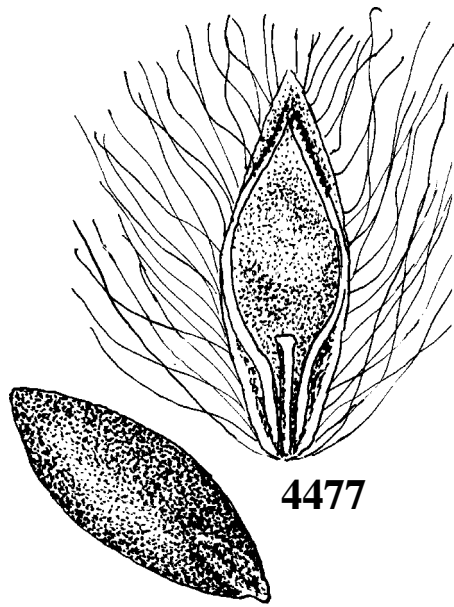
furrow, 1.8-2 x 0.7-0.8 mm. Surface glabrous, high lustrous, dark reddish-brown.  $2n = 18$ . Native to Eurasia, sunny slopes, rocky steppes and acacia (*Robinia pseudoacacia*) forests. Hu, Mo, Pl, Ro, Sk, Uk.

**4478. *Melica uniflora*** Retz. — Perennial, freely though usually vastly tufted, blades 20-60 cm high, very thin and feeble, smooth. Florets obovate, lemma of fertile floret ellipsoid, obtuse, slight shorter than the glumes, 4.5-5.5 x 1.6-2 mm. Caryopses ellipsoid, concavo-convex, ventral side indistinct longitudinal furrowed, 2.7-3.1 x 1.4-1.6 mm. Surface wrinkly, high lustrous, reddish-brown.  $2n = 18$ . Native to Europe, shady, leafy and coniferous woods, lowland forests. Hu, Mo, Pl, Ro, Sk, Uk.

**4479. *Beckmannia eruciformis*** (L.) Host, *Phalaris eruciformis* L. — Perennial, blades erect, 40-150 cm high, onion-like roughened at base, with nodules rooting down. Florets cordiform, with one caryopsis, lemma equal in size, inflated, 3-3.5 x 2.3-2.7 mm. Caryopses prolonged ellipsoid, planoconvex, ventral side longitudinal indistinct furrowed, 1.8-2.2 x 0.4-0.6 mm. Surface longitudinal striate, lustrous, yellowish.  $2n = 14$ . Native to Eurasia, saline soils, moist in spring, dry and in summer. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4480. *Dinebra retroflexa*** (Vahl) Panzer, *Dinebra arabica* Jacq. — Annual, tufted, blades erect, nodular ascendent, smooth. Florets ellipsoid, lemma 5-veinous, short hirsute at keel and margins, 1.8-2.2 x 0.5-0.7 mm. Surface straw-brown. Caryopses ellipsoid, apex round or slant on one side, 1.2-1.3 x 0.45-0.55 mm. Surface glabrous, slight lustrous, yellowish-brown.  $2n = 20$ . Native to northern Africa and southwestern Asia; rarely hauling into the Carpathians.

**4481. *Lolium multiflorum*** Lam., *L. italicum* A. Braun — Annual to perennial, densely tufted, blades erect or nodular ascendent below, 30-90 cm high, rough above. Florets ellipsoid, lemma oblong-lanceolate, awn up to 15 mm long, 6.2-6.8 x 1.1-1.3 mm. Surface short hirsute. Caryopses  $\pm$  cylindric, concavo-convex, 3.8-4.2 x 1.4-1.5 mm. Surface longitudinal faint striate, lustreless, dark-brown.  $2n = 14$ . Native to southwestern Europe, in the whole Carpathians often cultivated with other grass species for lawns and for fodder in meadows.



**4482. *Lolium perenne* L., *L. vulgare* Host** — Perennial, densely tufted, blades erect or ascendent at base, 30-90 cm high, with 2-4 articles. **Florets (left) oblong-lanceolate, lemma awnless, narrow membranous on apex, 6-8 x 1.5-1.8 mm. Caryopses (right) ellipsoid, planoconvex, 4.3-4.7 x 1.4-1.6 mm. Surface longitudinal faint striate, lustreless, dark-brown. 2n = 14.** Native to Europe, dry meadows and pastures, roads, lawns, waste places, often cultivated as a mixture for lawns; throughout the Carpathians.

**4483. *Lolium remotum* Schrank, *L. linicola* A. Braun, *L. arvense* Schrad.** — Annual, blades thin, feeble, ascendent, 30-80 cm high, rough above, sheaths bare. **Florets ellipsoid, lemma awnless or with very short awns, 4-5 x 1.8-2.2 mm. Caryopses ellipsoid, concavo-convex, 3.4-4 x 1.5-1.9 mm. Surface longitudinal faint striate, dull, brown. 2n = 14.** Native probably to the Mediterranean, a weed in fields, mainly on flax stands. Br, Hu, Pl, Ro, Sk, Uk.

**4484. *Lolium rigidum* Gaud., *L. perenne* L. subsp. *rigidum* (Gaud.) A. et D. Löve** — Annual to biennial, tufted, blades stiff, erect, 15-70 cm high, rough above, sheaths of leaves rough. **Florets ellipsoid, lemma awnless or very short 1-3x acuminate, 6-7 x 1.4-1.6 mm. Caryopses oblong-ellipsoid, concavo-convex, 3.8-4.2 x 1.1-1.2 mm. Surface longitudinal faint striate, lustreless, dark-brown. 2n = 14.** Native to the Mediterranean; rarely hauling with wool into the Carpathians. Ro, Uk.

**4485. *Lolium temulentum* L., *L. annum* Gilib.** — Annual, blades erect or nodular ascendent, 20-120 cm high, rough, with 3-5 articles, ramified at base, rough above. **Florets ellipsoid, lemma glabrous, awn 2x longer than the caryopsis, 4.7-5.5 x 1.6-2 mm. Surface of lemma short hirsute. Caryopses ellipsoid, concavo-convex, 3.8-4.2 x 1.6-1.8 mm. Surface longitudinal faint striate, lustreless, brown. 2n = 14.** Native to the Mediterranean; in the whole Carpathians growing as a weed in cereals (mostly in oats and rye).

**4486. *Pholiurus pannonicus* (Host) Trin., *Lepturus pannonicus* (Host) Kunth** — Annual, tufted in circle, blades erect or nodular ascendent, 5-20 cm high, branched at base, bare, smooth. **Florets oblong-cylindric, relative broad at base, lemma 7-9-veinous, apex blunt, 6-7 x 1.1-1.3 mm. Surface membranous, dirty straw-coloured. Caryopses cylindric, planoconvex, 3-angular, apex roundish with rest of the style, 2.8-3.2 x 0.8-0.9 mm. Surface**

**longitudinal striate, lustreless, yellowish. 2n = 14.** Native to Eurasia, saline grounds. Hu, Mo, Ro, Sk, Uk.

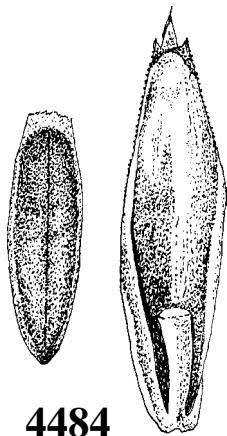
**4487. *Parapholis strigosa* (Dumort.) C. E. Hubb., *Lepturus filiformis* auct. non (Roth) Trin.** — Annual, blades ascendent or erect, to 40 cm high, downy above. **Florets cylindric, chaff lanceolate, acuminate, 4-7 mm long, 3-7-veinous, lemma thin membranous, acuminate, 5-6 x 1.1-1.3 mm. Caryopses cylindric, planoconvex, 3-angular, 3-3.2 x 0.8-0.9 mm. Surface glabrous, lustrous, yellowish. 2n = 28.** Native to the Mediterranean, salt-marshes; occasionally hauling into the Carpathians.

**4488. *Hainardia cylindrica* (Willd) Greuter** — Annual, stems up to 35 cm high, leaves reaching 70 x 25 mm. **Florets cylindric, chaff 3-ribbed, acuminate, lemma thin membranous, 7.2-7.8 x 1.9-2.1 mm. Caryopses cylindric, planoconvex, indistinct 3-angular, 3.2-3.8 x 1-1.2 mm. Surface smooth, slight lustrous, yellowish-brown. 2n = 26.** Native to southern Europe, saline or gypsiferous soils; rarely hauling into the Carpathians on saline areas.

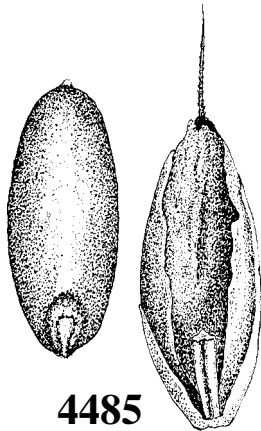
**4489. *Leymus arenarius* (L.) Hochst., *Elymus arenarius* L.** — Perennial, blades stiff, erect, 50-150 cm high, rough, smooth, bare, sheaths of leaves smooth. **Florets prolonged ellipsoid, lemma 5-7-veinous, acuminate, awnless, 12-15 x 2.5-2.7 mm. Surface of lemma dense and longitudinal hirsute. Caryopses cylindric, planoconvex, ventral side with deep longitudinal furrow, apex hairy, 8-9 x 2.3-2.5 mm. Surface longitudinal faint striate and wavy, dull, pale-brown. 2n = 56.** Native to the Northern and Baltic seas, sands of littoral and continental areas. Br, Pl, Ro, Uk.

**4490. *Hordeum bulbosum* Torn.** — Perennial, densely tufted, blades on base bulbiform, bulbs 10-15 mm in diam., stems erect, 50-130 cm high. **Florets ovoid, apex with awn, 6-7 x 1.6-1.8 mm. Surface smooth, straw-coloured. Caryopses cylindric, planoconvex, ventral side with longitudinal furrow, 3.8-4.2 x 1.4-1.6 mm. Surface longitudinal striate, lustreless, yellowish or greyish-brown. 2n = 14, 28.** Native to Eurasia, dry lawns and fallow margins, of lowland and upland zones. Ro, Uk.

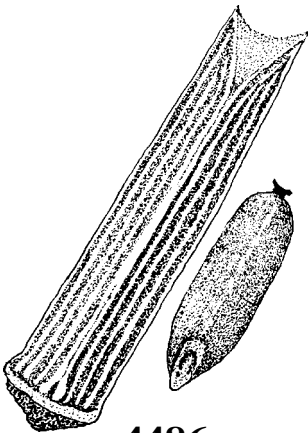
**4491. *Hordeum distichon* L. subsp. *distichon*, *H. vulgare* L. subsp. *distichum* (L.) Domin.** — Annual, blades 60-130 cm, pseudoear with 2 rows of erect,



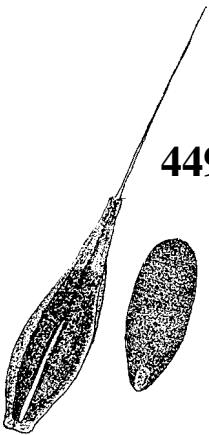
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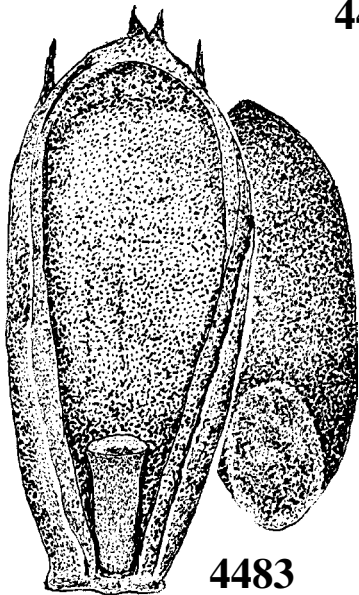
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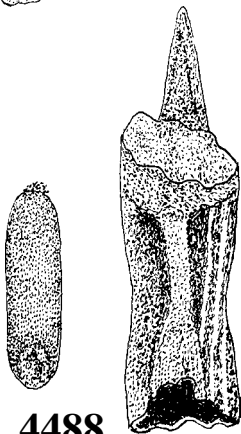
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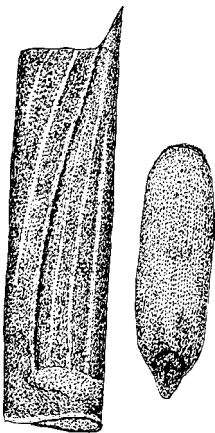
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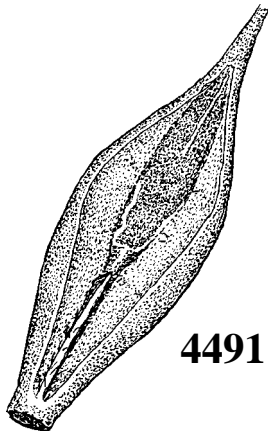
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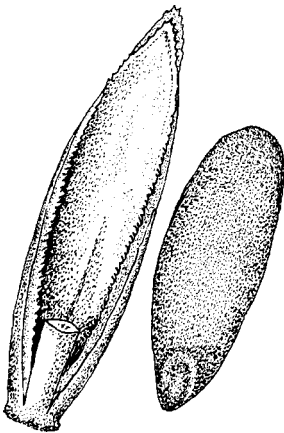
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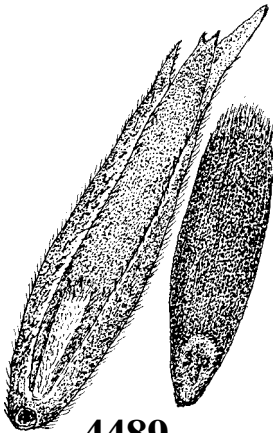
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simple, fertile earlets. **Florets ellipsoid or spindle-shaped, lemma 5-veinous, 10-11 x 3.2-4 mm. Surface poor hirsute. Caryopsis connected with lemma. 2n = 14.** Native to savage *H. spontaneum* C. Koch. Cultivated already in the Stone Age of semidry, basic up to neutral, loamy soils. At present most frequently cultivated as malting barley.

**4492. *Hordeum distichon* L. subsp. *zeocrithon* (L.) Čelak., *H. vulgare* var. *breve* Alef. –** Perennial, blades 60-130 cm high. Pseudoeare with 2 rows of simple, aslant distenced fertile earlets, awns of lemma conspicuously faintly decomposed. **Florets ellipsoid, lemma 5-veinous, rachilla poor hirsute, 9.5-10.5 x 3.3-4 mm. Caryopsis connected with lemma. 2n = 14.** Native to southern Europe; in the Carpathians cultivated in the part, temporarily hauling on rubbish heaps.

**4493. *Hordeum geniculatum* All., *H. hystrix* Roth –** Annual, blades 10-50 cm high, but sheaths of lower leaves with hairs 0.5-1.2 mm. **Florets ellipsoid, lemma adpressed, broad awn as long as the floret, 5.4-5.8 x 1.1-1.3 mm. Surface of lemma fine and scarce hirsute. Caryopses cylindric, planoconvex, ventral side longitudinal furrowed, 3.8-4.2 x 1-1.2 mm. Surface longitudinal striate, slight lustrous, violetish-brown. 2n = 14, 28.** Native to Eurasia, saline grounds, soils moist in spring and drying up in summer. Hu, Ro, Sk, Uk.

**4494. *Hordeum jubatum* L., *Critesion jubatum* (L.) Nevski –** Perennial, tufted, blades thin, nodular ascendent, sheaths of lower leaves scarcely hirsute. **Florets spindle-shaped, glumes with 3-5 cm long awn, lemma with c. 2.5 cm long awn, 5-6 x 1.1-1.3 mm. Surface bare, smooth. Caryopses cylindric, planoconvex, ventral side with longitudinal furrow, 3.4-3.8 x 1.1-1.2 mm. Surface longitudinal faint striate, dull, violetish-brown. 2n = 28.** Native to North America; in the Carpathians rarely cultivated as an ornamental in gardens, uniquely escaping.

**4495. *Hordeum leporinum* Link –** Annual, blade  $\pm$  crawling, sheaths of leaves roughly ribbed. **Florets spindle-shaped, lemma 5-7 veinous, awn very short and poor hirsute, 2-2.5 cm long, 7-8 x 1.7-2.3 mm. Surface smooth, lustreless, straw-coloured. Caryopses obovoid or cylindric, dorsal and ventral sides convex, ventral side longitudinal furrowed, 5-6 x 1.6-2 mm. Surface smooth, lustreless, whitish. 2n = 28.** Native to Eurasia, weed places, roadsides, dryer slopes and sands. Mo, Ro, Uk.

**4496. *Hordeum marinum* Huds., *H. maritimum* Stokes –** Annual, blades 10-60 cm high, erect or nodular ascendent, simple or free-tufted. **Florets ellipsoid, lemma 3-veinous, awn 7-9 mm long, short hirsute, 5-6 x 1.3-1.5 mm. Surface smooth, slight lustrous, brown. Caryopses cylindric, planoconvex, ventral side longitudinal furrowed, 3.1-3.3 x 1.3-1.4 mm. Surface longitudinal faint striate, dull, brown. 2n = 14 (28).** Native to Eurasian littoral territories; hauling into the Carpathians on rubbish heaps, waste places, roads and railways. Hu, Ro, Sk.

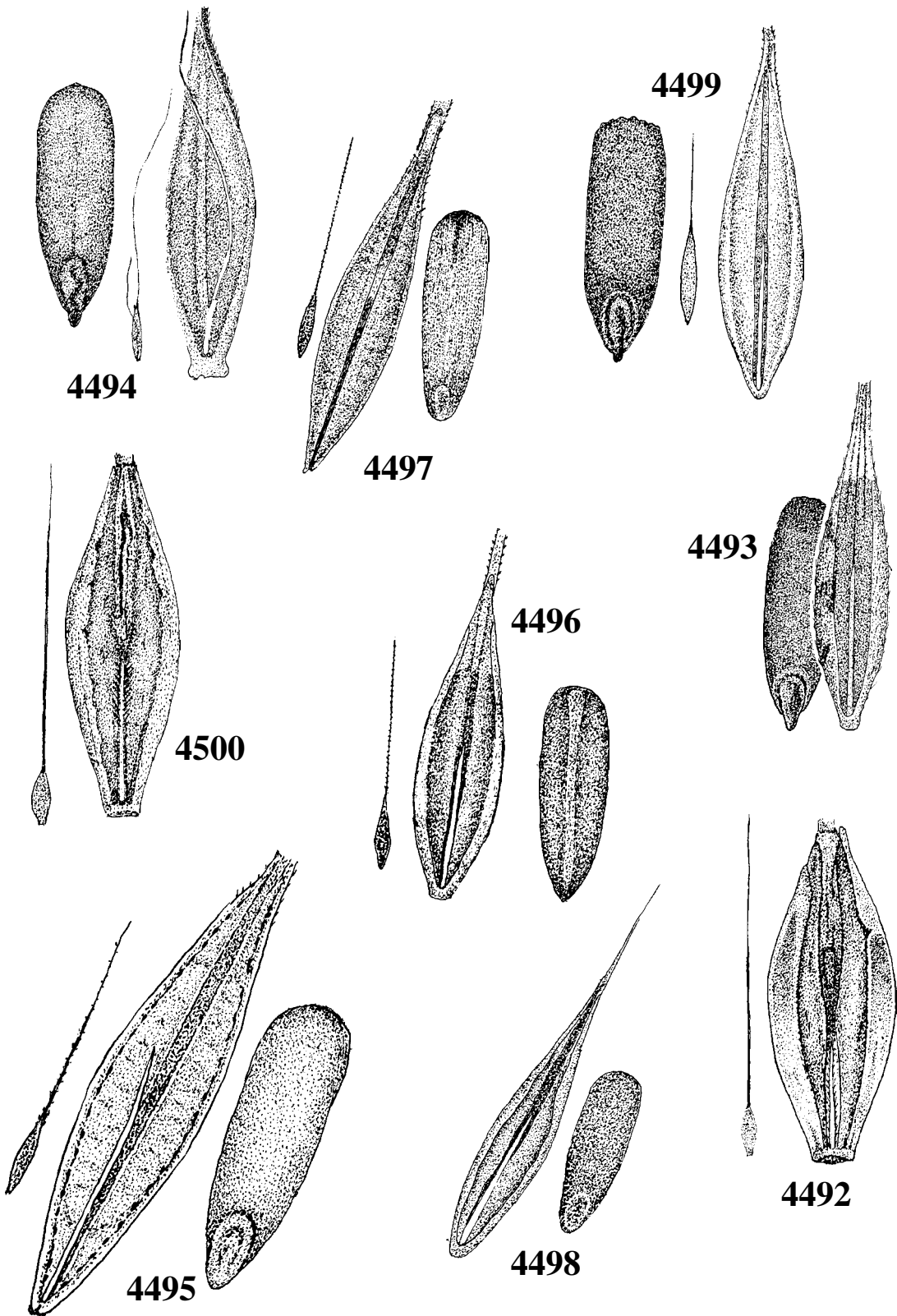
**4497. *Hordeum murinum* L. –** Annual, blades erect or nodular ascendent, 10-40 cm high, single or in free tufts, glabrous, weakly ribbed. **Florets rhomboid, lemma lanceolate with awn as much as  $\pm$  3x longer than the floret, short hirsute, 10-12 x 1.8-2.2 mm. Caryopses cylindric, planoconvex, ventral side with longitudinal furrow, 5.7-6.3 x 1.7-2 mm. Surface longitudinal faint striate, lustreless, yellowish-brown. 2n = 28.** Native to Eurasia, secondary circumpolar, sandy grounds, waste places, lawns and roadsides. Hu, Mo, Pl, Ro, Sk, Uk.

**4498. *Hordeum nodosum* L. –** Perennial, densely tufted, blades erect, slender, nodular ascendent, 30-80 cm high, glabrous. **Florets (left) rhomboid, surface of lemma fine waved, lustreless, awn as long as the floret, 5-6 x 1.4-1.7 mm. Caryopses (right) cylindric, apex  $\pm$  truncate, bottom narrowed, planoconvex, ventral side with longitudinal furrow, 4.2-4.6 x 1.3-1.5 mm. Surface longitudinal striate, slight lustrous, reddish-brown.** Native to Europe, moist lawns and saline places of the lowland zone. Pl, Ro, Uk.

**4499. *Hordeum secalinum* Schreb., *H. pratense* Huds., *H. nodosum* auct. non L. –** Perennial, densely tufted, blades 20-70 cm high, thin, erect or nodular ascendent, leafless above. **Florets rhomboid, awn c. 7 mm long, 6-7 x 1.4-1.7 mm. Surface of lemma bare, dull, straw-coloured. Caryopses cylindric, planoconvex, ventral side longitudinal furrowed, 4.1-4.5 x 1.3-1.5 mm. Surface longitudinal striate, dull, brown. 2n = 28.** Native to the Mediterranean; hauling into the Carpathians on dumps and railway stations, rare. Pl, Ro, Uk.

**4500. *Hordeum vulgare* L. subsp. *hexastichon* (L.) Čelak. –** Annual, in shape and growth very similar to subsp. *tetrastichon*. Pseudoeare, with 6 rows of simple fertile earlets, awns of lemma semiparallel with spindle of pseudoeare. **Florets narrow rhom-**





**boid, lemma 5-veinous, awn semierect, 5-6 cm long, rachilla ciliate, 9-10 x 2.7-3.3 mm. Caryopses connected with lemma.  $2n = 14$ .** Native to central Asia, ancestor of *H. agriocrithon* Aberg.; in the Carpathians rarely cultivated as a winter barley for fodder.

**4501. *Triticum aestivum* L.** em Fiori et Paul, *T. sativum* Lam., *T. vulgare* Vill. — Annual to biennial, stems 40-150 cm high, hollow, thin walled, nodules bare. **Caryopses ellipsoid, planoconvex, ventral side with longitudinal furrow, apex narrowed and poorly hairy, bottom narrowed with large hilum, 6-8.2 x 2.8-3.6 mm. Surface longitudinal faint striate, smooth or slight wrinkly, lustreless, pale-brown.  $2n = 42$ .** Origin unknown, (perhaps *T. dicoccon* x *Aegilops squarrosa* L.), grown (since the earlier Bronze Age) only in culture, in awn and awnless forms. Today it is the most important species cultivated worldwide.

**4502. *Triticum compactum* Host** — Annual to biennial, stems stiff, 90-140 cm high, hollow, thin-walled, bare also at nodules. **Caryopses ellipsoid, planoconvex, ventral side with longitudinal furrow, apex poor hairy, 7-7.6 x 2.8-3.2 mm. Surface longitudinal faint striate, glabrous or slight wrinkly in upper part, lustreless, pale-brown.  $2n = 42$ .** Origin unknown (perhaps *T. dicoccon* x *Aegilops cylindrica*), since the early Bronze Age often, yet only rarely cultivated in the Carpathians.

**4503. *Triticum dicoccon* Schrank** — Annual, rarely biennial, stems stiff, 80-130 cm high, full or thick-walled and hollow, bare or at nodules downy. **Caryopses ellipsoid, planoconvex, ventral side with longitudinal furrow, apex hairy, bottom with large hilum, 7-8 x 2.3-2.7 mm. Surface longitudinal faint striate, slight lustrous, brown.  $2n = 28$ .** Originated from *T. dicoccoides* Körn. ex Tausch (Front Asia); in the Carpathians cultivated since the early Bronze Age in the past, now very rare. Hu, Pl, Ro, Sk.

**4504. *Triticum durum* Desf.** — Annual to biennial, stems stiff, 70-140 cm high, full or thick-walled and hollow, bare also on nodules. **Caryopses cylindric, planoconvex, ventral side with longitudinal furrow, apex poor hairy, bottom with relative small hilum, 8-10 x 3-3.6 mm. Surface longitudinal faint striate and transversal faint wrinkly, slight lustrous, rufous.  $2n = 28$ .** Origin unknown (perhaps from *T. dicoccon*, native to Front and Middle Asia; in

the Carpathians rarely cultivated as raw material for macaroni and similar products.

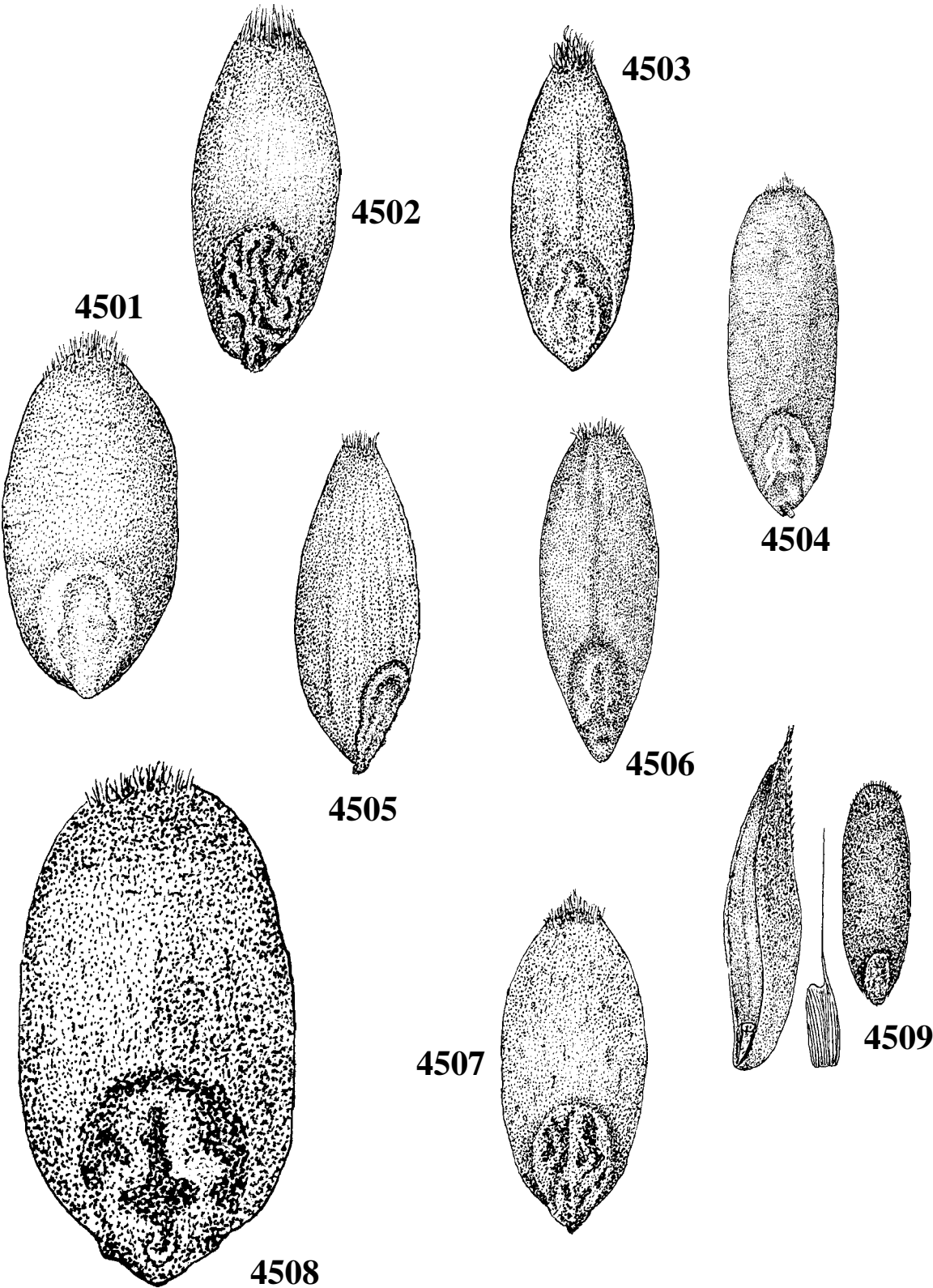
**4505. *Triticum monococcum* L.** — Annual to biennial, stems thin, 80-130 cm high, full or thick-walled, nodules hirsute. **Caryopses ellipsoid, lateral strong compressed, ventral side with longitudinal furrow, apex hairy, bottom with large hilum, 7-8 x 2.5-3 mm. Surface longitudinal ribbed, fine wrinkly, slight lustrous, reddish-brown.  $2n = 14$ .** Native to Eurasia, originated from the wild-growing *T. baeoticum* Boiss.; in the Carpathians grown since the period of wood stud-buildings, at present grown only experimentally.

**4506. *Triticum polonicum* L.** — Annual, stems 80-150 cm high, stiff, thin-walled, bare, rarely downy on nodules. **Caryopses ellipsoid or spindleshaped, planoconvex, 3-angular, ventral side longitudinal furrowed, apex poor hairy, 8-10.5 x 2.5-3.5 mm. Surface longitudinal striate, slight lustrous, rufous.  $2n = 28$ .** Native to Spain; in the Carpathians cultivated in the past, today hauling but uniquely. Hu, Pl, Ro, Sk.

**4507. *Triticum spelta* L.** — Annual to biennial, stems 60-150 cm high, hollow, thin-walled, bare also on nodules. **Caryopses ellipsoid, concavo-convex, 3-angular, ventral side with longitudinal furrow, narrowed apex poor hairy, narrowed bottom with large hilum, 7-9 x 2.8-3.4 mm. Surface longitudinal faint striate, lustreless, pale-brown.  $2n = 42$ .** A species of hybrid origin (perhaps *T. dicoccon* x *compactum* or *T. dicoccoides* x *Aegilops squarrosa* L.). Previously often cultivated (since a Bronze Age); in the Carpathians, today rarely and occasionally hauling on cereal fields.

**4508. *Triticum turgidum* L.** — Annual to biennial, stems 120-170 cm high,  $\pm$  full, thick-walled, young plant finely and shortly hirsute. **Caryopses ellipsoid, planoconvex, ventral side with longitudinal furrow, apex poor hairy, 6-7 x 3.2-3.6 mm. Surface longitudinal faint striate, lustreless, brown.  $2n = 28$ .** Origin unknown (perhaps mutant of *T. dicoccon*). A species cultivated in the ancient times, today rarely grown in southern Europe (Rivet wheat). Hu, Ro, from time to time hauling northern with cereals.

**4509. *Aegilops cylindrica* Host, *Triticum cylindricum* (Host) Cesati** — Annual, bunchy tufted, stems numerous, 20-40 cm high, ascendent up to erect,



lower sheaths of leaves scarcely hirsute. **Florets ellipsoid, 3-dentate, short awned, upper part of keel and awn hirsute, rachilla short, hairy, 7-10 x 1.8-2.2 mm. Surface of lemma bare. Caryopses cylindric, planoconvex, ventral side longitudinal furrowed, apex short hairy, 5-7 x 1.7-2 mm. Surface longitudinal striate, slight lustrous, pale-brown. 2n = 28.** Native to Eurasia, sunny, dry uplands and sandbanks. Hu, Mo, Ro, Sk, Uk.

**4510. *Aegilops geniculata* Roth, *Ae. ovata* L. p. p.** — Annual, stems tufted, numerous, 10-30 cm high, leafless above, sheaths of leaves bare,  $\pm$  inflated. **Florets semiglobular, lemma tummy-arch with strong short hirsute awns, 9-11 x 5-6 mm. Caryopses ellipsoid, planoconvex, ventral side with longitudinal furrow, apex faint hirsute, 7-8 x 2.6-3 mm. Surface longitudinal striate, slight lustrous, brown. 2n = 38.** Native to southern Europe, on dryer and uncultivated stands, roadsides; rarely hauling into the Carpathians. Ro, Uk.

**4511. *Aegilops triuncialis*** — Annual, stems 20-45 cm high, spikes 4-5 cm, high, spikes 4-6.5 mm long (without awns) consists of 4-6 spikelets, apex with 2-4 longer awns. **Caryopses ellipsoid, planoconvex, dorsal side longitudinal faint striate, ventral side with longitudinal furrow in the middle, apex hairy, bottom part gradually narrowed with oval hilum, 7.5-8.5 x 2.6-3 mm.** Native to southeastern Eurasia, on dry and stony slopes and similar substrates. Ro, Uk.

**4512. *Bromus arvensis* L., *Bromus hyalinus* Schur** — Annual to biennial,  $\pm$  tufted, blades erect, 30-100 cm high, sometimes nodular ascendent, sheaths of leaves softly and sparsely hirsute. **Florets (right) obovoid, lemma indistinct 7-veinous, coarse, shallow 2-dentate above, awn 6-10 mm long, thin, erect, 6.4-7.6 x 1.4-1.8 mm. Caryopses (left) obovate concavo-convex, 3-angular, apex hairy, 5-6 x 1.2-1.6 mm. Surface longitudinal faint striate, slight lustrous, violetish-brown. 2n = 14.** Native to Eurasia, stony and sunny slopes, boundaries, fields, embankments, waste places; in all Carpathian territories.

**4513. *Bromus benekenii* (Lange) Trimen, *Bromopsis benekenii* (Lange) Holub** — Perennial, tufted, blades erect, 60-120 cm high, scarcely downy, sheaths of leaves shortly hirsute. **Florets oblong spindleshaped, lemma and palea hirsute at margins, awn 5-8 mm long, coarse, rachilla short hirsute, 10-12 x 1.7-2 mm. Caryopses cylindric, concavo-convex, 3-**

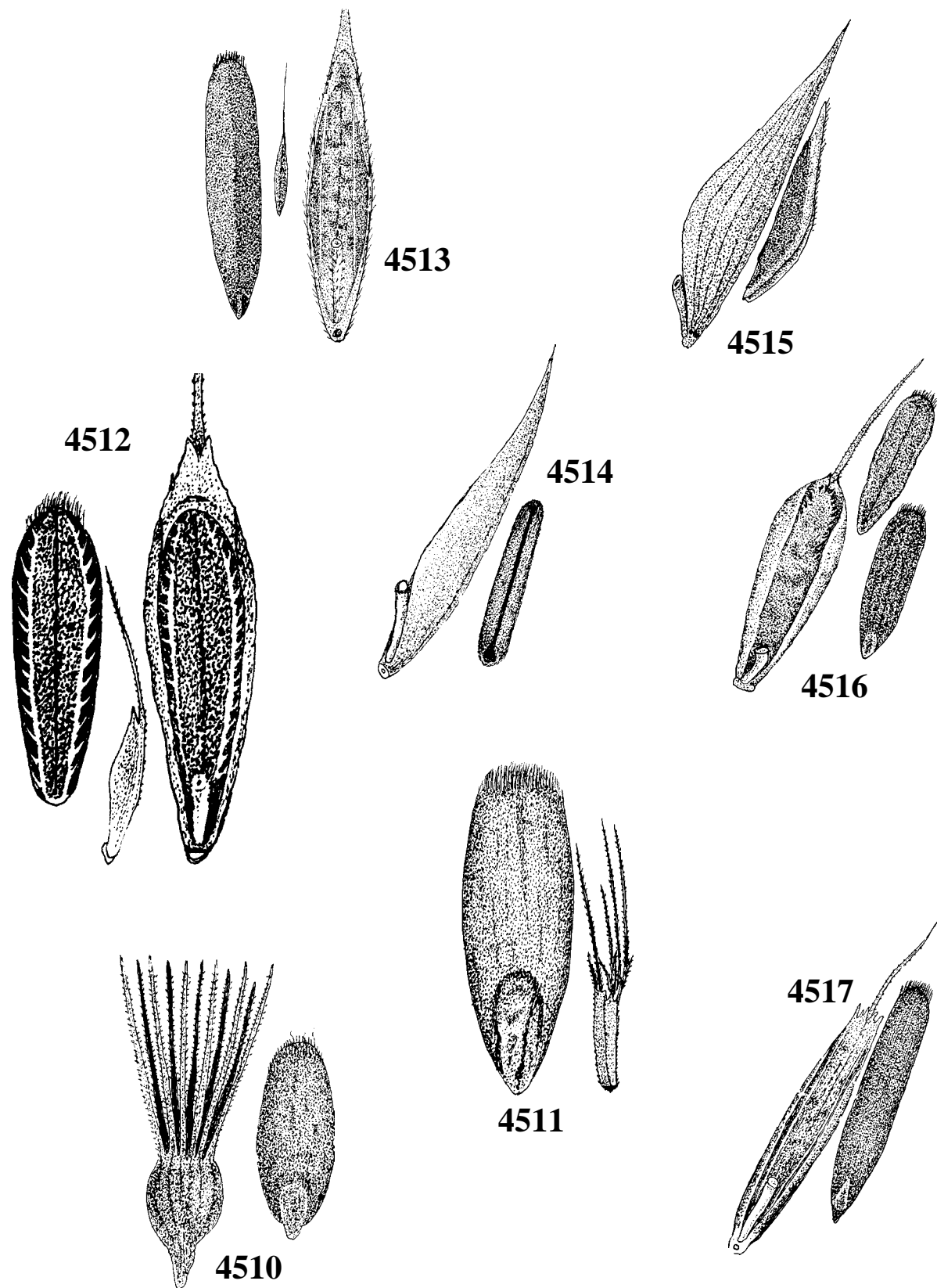
**angular, dorsal side rooflike, ventral longitudinal furrowed, 8-8.5 x 1.5-1.7 mm. Surface longitudinal striate, dull, violetish-brown. 2n = 28.** Native to Eurasia, mixed beach- and scree-woods and shrub-beries. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4514. *Bromus carinatus* Hook. et Arn., *Ceratochloa carinata* (Hook. et Arn.) Tutin** — Perennial, stems 30-80 cm high, erect, glabrous, panicle 15-30 cm, spikelets 25-30 mm long. **Florets broad lanceolate, lemma with keel on the back, palea c. 2/3 of the lemma, 16-20 x 2-2.4 mm. Surface smooth, indistinct veinous, dull, straw-coloured. Caryopses concavo-convex, longitudinal furrow narrow and deep, brown, 7.8-8.2 x 1.9-2.2 mm. Surface fine waved, lustreless, dark-brown. 2n = 56.** Native to North America, rarely hauling into the Carpathians.

**4515. *Bromus catharticus* Vahl, *B. willdenowii* Kunth** — Laxly caespitose, stems 15-150 cm high, erect or ascending, panicle 5-30 cm high, lax with patent branches. **Florets (left) broad lanceolate, lemma with keel on the back, palea about half as long as the lemma, 16-20 x 2.5-2.8 mm. Surface distinct veinous, smooth, lustreless, straw-coloured. Caryopses (right) lateral compressed, concavo-convex, lateral verges winged, wings in upper part ciliate, 9-13 x 1.8-2 mm. Surface smooth, dull, brown, wings straw-coloured. 2n = 42.** Native to South America; occasionally hauling into the Carpathians.

**4516. *Bromus commutatus* Schrad., *B. pratensis* auct. non Ehrh.** — Biennial, rarely annual, blades erect, 40-120 cm high, rarely ascendent, bare, sheaths finely hirsute. **Florets obovoid, lemma margins narrow membranous, distinct veinous, coarse, apex 2-dentate, awn 6-10 mm long, short hirsute, rachilla bended, 8.5-9.5 x 2.3-2.7 mm. Caryopses cylindric, concavo-convex, apex hairy, 7-7.8 x 1.7-1.9 mm. Surface longitudinal faint striate, slight lustrous, reddish-brown. 2n = 14.** Native to Europe, along roads, fallows, meadows, pastures, fields; throughout the Carpathians.

**4517. *Bromus erectus* Huds., *Bromopsis erecta* (Huds.) Fourr.** — Perennial, tufted, blades stiff, erect, smooth and bare, 40-120 cm high, sheaths of leaves scarcely hirsute. **Florets prolonged cylindric, lemma bare, veins scarce hirsute, keel coarse, awn 3-7 mm long, coarse, rachilla faint coarse, 9.2-10 x 1.6-1.8 mm. Caryopses cylindric, concavo-convex, apex hairy, bottom narrowed into germ hilum, 8-**



**8.6 x 1.5-1.7 mm. Surface longitudinal faint striate, slight lustrous, violetish-brown.  $2n = 56$ .** Native to Europe, sunny, stony and grassy slopes, steppe meadows of warmer areas. Hu, Pl, Ro, Sk, Uk.

**4518. *Bromus hordeaceus* L., *B. mollis* L. –** Annual, biennial,  $\pm$  tufted, blades erect, 10-80 cm high, sheaths of leaves softly hirsute. **Florets obovate, lemma tummy-like, inflated, 7-veinous, apex shallow 2-dentate, with narrow membranous border, awn up to 10 mm long, 7.7-8.3 x 1.8-2 mm. Surface of lemma hirsute. Caryopses ellipsoid, concavo-convex, ventral side with longitudinal furrow, apex hairy, 6-7 x 1.7-1.9 mm. Surface longitudinal faint striate, lustreless, reddish-brown.  $2n = 28$ .** Native to Eurasia, fallows, rubbish heaps, meadows, fields, pastures and boundaries. Hu, Pl, Ro, Sk, Uk.

**4519. *Bromus inermis* Leyss., *Bromopsis inermis* (Leyss.) Holub –** Perennial, blades erect, 50-150 cm high, smooth, sometimes slightly scabrous above, sometimes hirsute beneath nodules. **Florets prolonged ellipsoid, lemma 5-veinous, without or with very short awn, 8-10 x 2-2.4 mm. Surface of lemma bare, rare hirsute blunt. Caryopses oblong-ellipsoid, strong compressed, slight concavo-convex, bottom narrowed with small hilum, 7-7.5 x 1.6-1.8 mm. Surface dull, dark to blackish-brown.  $2n = 28$  (56).** Native to circumpolar territories, dry meadows, lawns, boundaries, hills and along railways. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4520. *Bromus intermedius* Guss. –** Perennial, blade erect, up to 50 cm high, striate, glabrous. **Florets ellipsoid, lemma dense downy, margins membranous, coarse margin of palea ciliate, awn 3-5 mm long, 7.4-7.8 x 2-2.4 mm. Caryopses spindle-shaped, very weak concavo-convex, strong compressed, 7-7.4 x 1.8-2.2 mm. Surface slight lustrous, violetish-brown.** Native to the Mediterranean, sunny lawns, ruderal habitats and sandbanks of the lowland zone. Ro.

**4521. *Bromus japonicus* Thunb., *B. patulus* Mert. et W. D. J. Koch –** Annual to biennial, blades erect or ascendent, 15-60 cm high, bare, stiff, thick, sheaths of lower leaves hirsute. **Florets ellipsoid, lemma with distinct 9-veinous, narrow membranous bordered, short 2-dentate, awl 4-12 mm long, coarse, 8-9 x 2-2.4 mm. Surface of lemma bare. Caryopses cylindric, concavo-convex, apex hairy, ventral side with longitudinal furrow,**

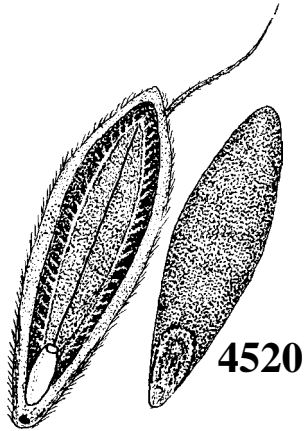
**6.8-7.2 x 1.5-1.7 mm. Surface longitudinal faint striate, lustreless, reddish-brown.  $2n = 14$ .** Native to Eurasia, fields, fallows, sunny slopes, roads and light forests; in all Carpathian territories.

**4522. *Bromus lanceolatus* Roth, *B. macrostachys* Desf. –** Annual, blades erect or nodular ascendent, 40-70 cm high, bare or downy above, nodules sometimes hirsute. **Florets obovate, lemma with 7-9-veinous, apex 2-dentate, awn 6-12 mm long, erect, hirsute, crooked, 12-15 x 3-3.6 mm. Surface of lemma dense downy. Caryopses ellipsoid, planoconvex, ventral side with longitudinal furrow, apex usually hairy, 8.8-9.5 x 1.9-2.1 mm. Surface longitudinal striate, lustreless, pale to violetish-brown.  $2n = 18$ .** Native to the Mediterranean; rarely hauling into the Carpathians, on dumps and railway stations. Pl, Sk.

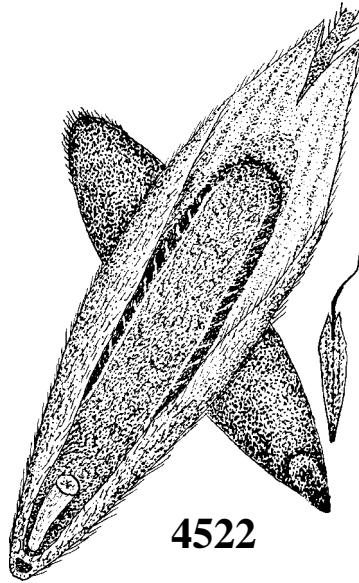
**4523. *Bromus madritensis* L., *Anisantha madritensis* (L.) Nevski –** Annual,  $\pm$  tufted, blades 10-60 cm high, numerous, erect or ascendent, thin, smooth or scarcely hirsute. **Florets (right) linear-lanceolate, lemma with membranous and convoluted margins, apex membranous 2-dentate, bare, rachilla c. 2 mm, glabrous, awns 1-2 cm long, coarse, 12-17 x 1.4-1.7 mm. Surface coarse, lower part violetish. Caryopses (left) prolonged spindle-shaped, concavo-convex, ventral side with longitudinal furrow, 8-9 x 1.3-1.5 mm. Surface lustreless, violetish-brown.  $2n = 28$  (42).** Native to the Mediterranean; rarely hauling into the Carpathians, on dumps and railway stations. Uk.

**4524. *Bromus monocladius* Domin, *Bromopsis monoclada* (Domin) Holub –** Perennial, blades stiff, erect, single, 70-130 cm high, with unflowering creeping spurs at base, sheaths fully bare. **Florets prolonged linear, awn 5-10 mm long, coarse, palea margins short hirsute, 9.5-10.5 x 1.2-1.4 mm. Surface of lemma coarse or short hirsute. Caryopses cylindric, concavo-convex, apex hairy, 7-8 x 1-1.2 mm. Surface longitudinal striate, slight lustrous, violetish-brown.  $2n = 28$ .** Native to the West Carpathians, dolomite and calcite rocks and slopes. Hu, Sk.

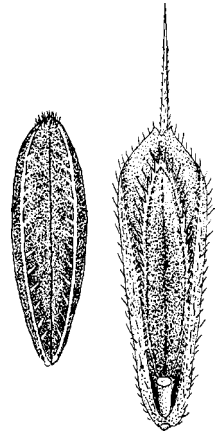
**4525. *Bromus pannonicus* Kummer et Sendtner, *Bromopsis pannonica* (Kummer et Sendtner) Holub –** Perennial, blades up to 75 cm high, tufted. **Florets ellipsoid, lemma on veins coarse or hirsute, awn 3-7 mm long, slight coarse, 9.5-10.5 x 1.5-2 mm. Caryopses cylindric, concavo-convex,**



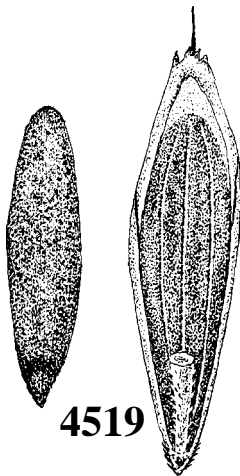
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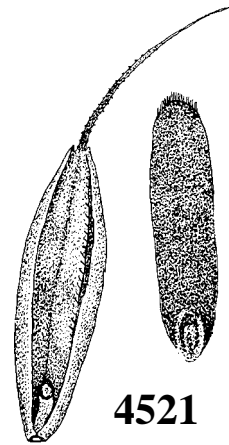
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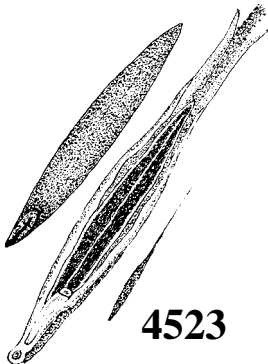
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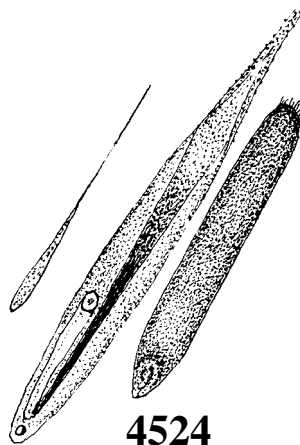
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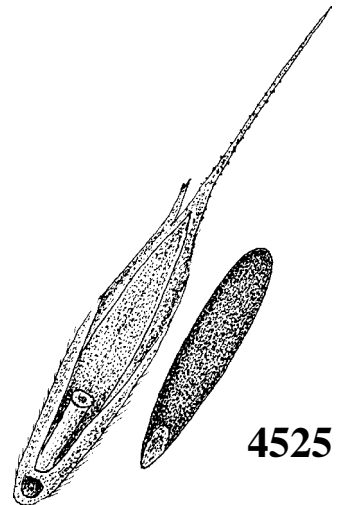
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4525

**6-7 x 1-1.3 mm. Surface longitudinal striate, slight lustrous, violetish-brown.  $2n = 28$ .** Native to Pannonia, dolomite and calcite rocks and slopes. Hu, Ro, Sk (?).

**4526. *Bromus racemosus* L.** — Annual, biennial, blades 30-100 cm high, erect or ascendent, bare or rarely shortly downy. **Florets obovate, lemma indistinct 7-veinous, bare, sometimes coarse above, awn 5-8 mm long, coarse, 8.5-9.5 x 2.4-2.8 mm. Caryopses ellipsoid, concavo-convex, compressed, apex hairy, bottom gradually narrowed, 7.4-8 x 1.8-2.2 mm. Surface longitudinal faint striate, lustreless, reddish-brown.  $2n = 28$ .** Native to Europe, moist and swampy meadows, fields, gardens and rubbish heaps. Hu, Pl, Ro, Sk, Uk.

**4527. *Bromus ramosus* Huds., *B. serotinus* Beneken, *Bromopsis ramosa* (Huds.) Holub** — Perennial, densely tufted, stems erect, 60-190 cm high, downy, spikes with 4-12 flowers. **Florets spindle-shaped, narrowed at both ends, lemma distinct 3-veinous, palea 3-veinous, apex with 3-4 mm long awn, 10-13 x 2-2.7 mm. Surface of lemma hairy. Caryopses ellipsoid, concavo-convex, dorsal side with longitudinal rib, ventral with longitudinal furrow and 2 ribs, apex hairy, 8.8-9.6 x 2-2.4 mm. Surface smooth, brown.  $2n = 42$ .** Native to Eurasia; humous woods and shrubberies. Hu, Pl, Ro, Sk, Uk.

**4528. *Bromus rigidus* Roth, *B. diandrus* Roth., *B. villosus* Forsk.** — Annual to biennial, tufted, blades erect, 20-40 cm high, downy at least above, sheaths of leaves furrowed. **Florets narrow lanceolate, lemma protrudent veinous, 3-dentate, awn up to 5 mm long, 18-22 x 1.9-2.1 mm. Caryopses prolonged cylindric, strong concavo-convex, apex hairy, 6.2-7 x 1.8-2 mm. Surface longitudinal faint striate, slight lustrous, dark-brown.  $2n = 42$ .** Native to the Mediterranean; rarely hauling into the Carpathians. Hu, Ro.

**4529. *Bromus riparius* Rehm., *B. fibrosus* Hock.** — Perennial, densely tufted, blades geniculate, erect or ascendent, up to 140 cm high. **Florets oblong-lanceolate, lemma on 5-7 veins hirsute, upper part membranous, palea margins ciliate, awn 5-7 mm, coarse, 11-13 x 1.8-2 mm. Caryopses cylindric, concavo-convex, apex hairy, 8.8-9.8 x 1.6-1.8 mm. Surface longitudinal striate, dull, violetish-brown.** Native to central and southeastern Europe, sunny grassy and calcareous slopes of montane and subalpine zones. Mo, Ro, Uk.

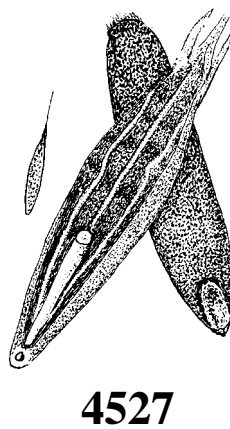
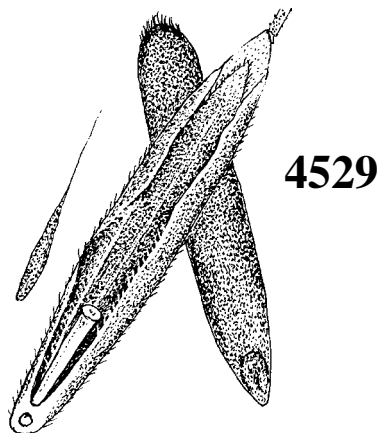
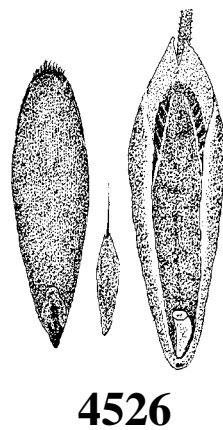
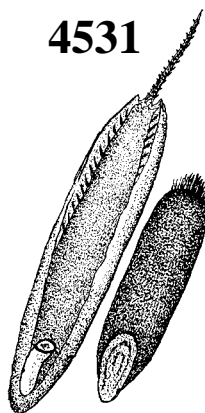
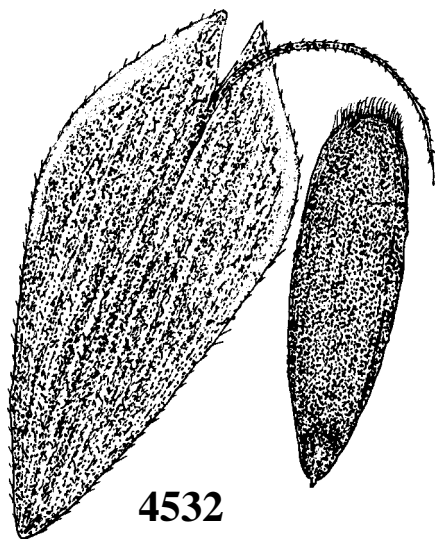
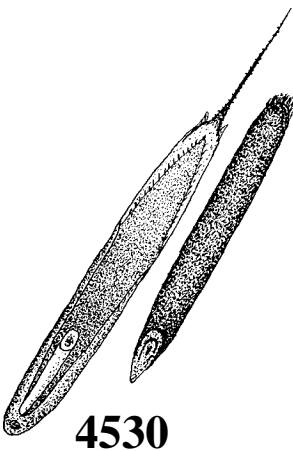
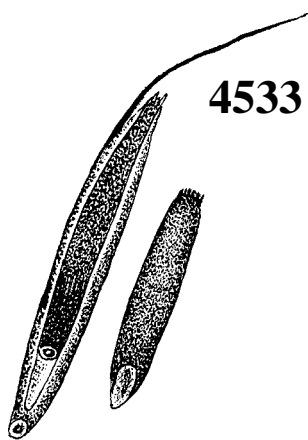
**4530. *Bromus scoparius* L., *B. rigens* L.** — Annual to biennial, often tillering abundantly, stems 10-50 cm high, erect or ascending, panicle erect, very dense, cuneate at base. **Florets prolonged ellipsoid, lemma oblong-lanceolate, 8-10 mm tall, two-fid at apex, awn near equal lemma, palea slight shorter than the lemma, at upper part ciliate, 8-10 x 1.1-1.3 mm. Caryopses concavo-convex, hairy at apex, 7-8.5 x 1-1.1 mm. Surface glabrous, lustreless, brown.  $2n = 14$ .** Native to southern Eurasia, sunny coasts, steppe pastures, roadside verges of the lowland zone. Mo, Ro, Uk.

**4531. *Bromus secalinus* L.** — Annual to biennial, often caespitose, 30-100 cm high, erect or shortly ascending, usually stout, leaf sheaths mostly glabrous or obscurely hairy. **Florets oblong-ellipsoid, lemma corneous, shallow emarginate at apex, palea equaling lemma, fine ciliate in upper part, awn up to 7 mm long, straight or flexuous, 9-11 x 1.9-2.2 mm. Caryopses cylindric, concavo-convex, apex rounded, hairy, bottom narrowed, 5.8-6.5 x 1.6-1.8 mm. Surface glabrous, lustreless, brown.  $2n = 28$ .** Native to southern and southcentral Europe, fields, rubbish heaps, boundaries; rare in the whole Carpathians.

**4532. *Bromus squarrosus* L.** — Annual to biennial, blades erect or nodular ascendent, 30-60 cm high, rough, bare, sheaths of leaves downy up to hirsute. **Florets broadly deltoid, lemma tumid, 9-11-veinous, short 2-dentate, membranous border, awn crooked out, up to 10 mm, 9-11 x 3.7-4.3 mm. Surface of lemma dense hirsute. Caryopses obovoid, concavo-convex, compressed, apex hairy, bottom narrowed, 6.2-7 x 1.8-2.2 mm.  $2n = 14$ .** Native to Eurasia, sunny and dry slopes, vineyards, fallows boundaries, sandbanks, embankments and fields; in all Carpathian regions.

**4533. *Bromus sterilis* L., *Anisantha sterilis* (L.) Nevski** — Annual to biennial, hardly tufted, blades erect or nodular ascendent, 30-100 cm high, bare, sheaths of leaves downy or softly hirsute. **Florets narrow lanceolate, palea membranous with hirsute margins, lemma 12-18 mm long with equal long awn, both coarse, apex sharp 3-dentate, margins membranous in upper part, rachilla coarse, 12-18 x 1.7-2 mm. Surface straw-coloured. Caryopses cylindric, concavo-convex, apex hairy, 8-9 x 1.5-1.7 mm. Surface longitudinal faint striate, dull, reddish-brown.  $2n = 14$  (28).** Native to Eurasia, in





shrubberies, fields, boundaries, gardens and embankments. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4534. *Bromus tectorum* L., *Anisantha tectorum* (L.) Nevski** – Annual to biennial,  $\pm$  tufted, blades, ascendent or erect, 10-90 cm high, bare, often downy above. **Florets (right) narrow ellipsoid, lemma with broad membranous border, awn 16-18 mm long, coarse, 9-10 x 1.3-1.6 mm. Surface of lemma distinct venous, hirsute. Caryopses (left) oblong-ellipsoid, concavo-convex, ventral side with longitudinal furrow, dorsal rooflike, apex hairy, 6.8-7.2 x 1.2-1.4 mm. Surface lustreless, violetish-brown. 2n = 14.** Native to Eurasia, roads and forest margins, sandbanks, fallows, embankments, boundaries, walls, waste places. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4535. *Bromus unioloides* (Willd.) Beauv.** – Biennial to perennial, free tufted, blades erect or ascendent, rough, 20-80 cm high, sheaths of lower leaves hirsute. **Florets spindleshaped, lemma with keel, distinct 11-13-veinous, coarse, awn 2-6 mm long or absent, 14-20 x 1.6-1.8 mm. Caryopses cylindric, strong concavo-convex, with keel on back, apex hairy, 7.5-8.2 x 1.4-1.6 mm. Surface longitudinal faint striate, slight lustrous, dark-brown. 2n = 42.** Native to South America; rarely hauling into the Carpathians.

**4536. *Taeniatherum caput-medusae* (L.) Nevski, *T. asperum* (Simonk.) Nevski** – Annual, stems 10-50 cm high, glabrous, leaves 0.2-0.6 mm wide, glabrous to scabrous and sparsely hairy on veins and at margins. **Florets spindleshaped, lemma 4-10 mm, strong and long awn (5-12 cm), 7-9 x 2-2.2 mm. Surface straw-coloured. Caryopses ovoid, concavo-convex, 6-7 x 1.7-1.9 mm. Surface smooth, faint lustrous, pale-brown. 2n = 14.** Native to southern Europe, dry fields and rocky places. Mo, Ro, Uk.

**4537. *Avena barbata* Brot., *A. hirsuta* Roth** – Annual to biennial, blades erect, 60-100 cm high, panicle one-sided. **Florets prolonged ovoid, lemma 5-7-veinous, in lower part dense ciliate, apex 2-dentate growing out into fine hairlets, dorsal awn 4-5 cm long, below half spiral coiled round, 15-25 x 1.8-2.2 mm. Caryopses cylindric, planoconvex, ventral side with longitudinal furrow, apex hairy, 6.8-7.5 x 1.3-1.5 mm. Surface dense hirsute, yellowish. 2n = 14, 28.** Native to Asia Minor, fields, waste places and dry hills of lowland and upland zones. Hu, Ro, Uk.

**4538. *Avena fatua* L., *A. acutiformis* (Malzev) Malzev** – Annual to biennial, blade erect, 60-150 cm

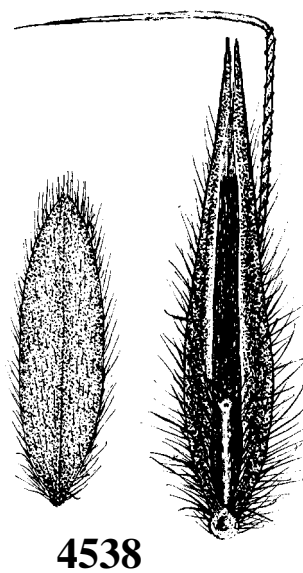
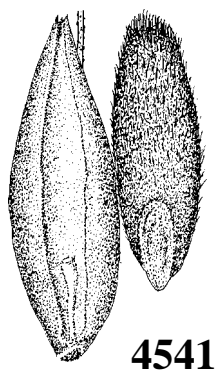
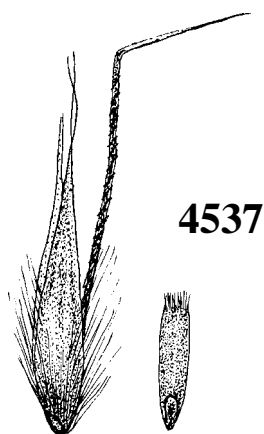
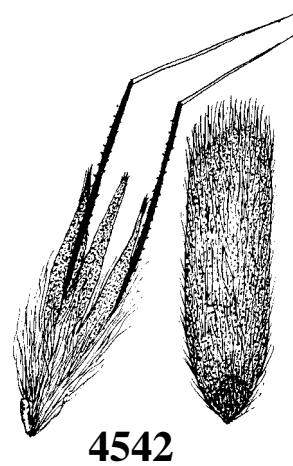
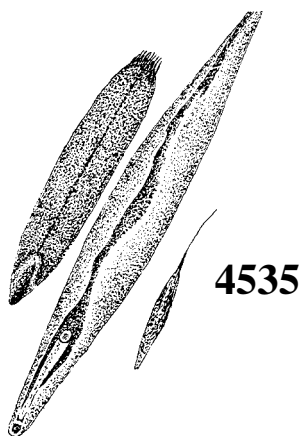
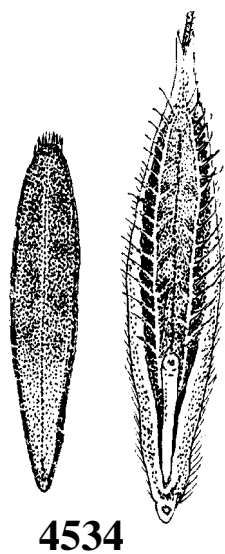
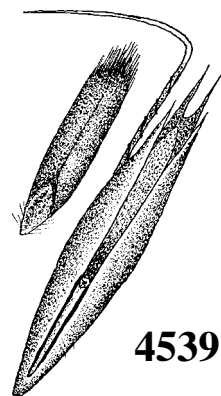
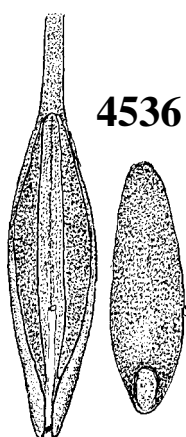
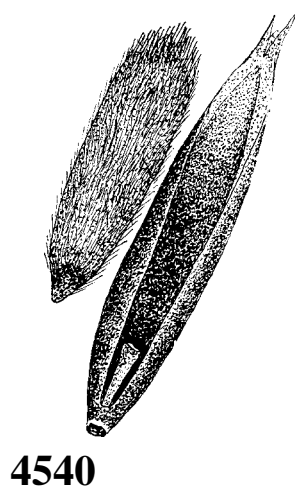
high, bare. **Florets oblong ovoid-lanceolate, apex acuminate, 2-dentate, awn bended, 13-20 x 2.4-2.8 mm. Surface and rachilla dense ciliate. Caryopses ellipsoid, planoconvex, ventral side longitudinal furrowed, 7.5-8.5 x 2.2-2.4 mm. Whole surface ciliate, lustreless, yellowish. 2n = 42.** Native to southeastern Europe, often found as a field weed on fallows and waste places; in all Carpathian territories.

**4539. *Avena nuda* L.** – Annual, blades 45-90 cm high, scabrous, waxy hoary. **Florets obovate, lemma in lower part bare, coarse above, awn in lower part spiral coiled around, 11-13 x 1.8-2.2 mm. Caryopses cylindric, planoconvex with longitudinal furrow on ventral side, upper part hairy, lower part gradually narrowed and ciliate, 5.4-6.2 x 1.3-1.5 mm. Surface fine wrinkly, lustreless, pinkish or greyish-brown, 2n = 14.** Perhaps originated from *A. strigosa*; in the Carpathians first cultivated for fodder in the past, today rarely hauling as a weed into fields and waste places.

**4540. *Avena orientalis* Schreb.** – Annual, blades stiff erect, 50-90 cm high, panicle narrowly compressed, one-sided, twigs erect. **Florets prolonged ellipsoid, lemma bare, 2-dentate, awned or awnless, 13-15 x 2.5-2.8 mm. Surface middle and bottom parts slight lustrous, dark-brown, apex membranous, pale. Caryopses cylindric, ventral side longitudinal furrowed, 9-10 x 2.3-2.6 mm. Surface dense hirsute, yellowish. 2n = 42.** Native to eastern Europe; in the Carpathians grown in the past, now found as weed in cereal fields. Mo, Pl, Ro, Uk.

**4541. *Avena sativa* L.** – Annual, veinous, acuminate, 2-dentate, awned, blades erect or shortly, ascendent, 40-150 cm high, bare, smooth, sheaths of leaves bare, smooth, panicle universally prostrate. **Florets ellipsoid, lemma at base gristly, veinless, above bare, veinous, acuminate, 2-dentate, awned from back, 9-15 x 2.7-3.3 mm. Caryopses ellipsoid, planoconvex, ventral side with longitudinal furrow, 7-8.5 x 3-3.5 mm. Surface dense hirsute, lustreless, yellowish or whitish. 2n = 42.** Native to eastern Europe, since the Bronze Age cultivated in fields, mostly in mountain sites in many cvs.

**4542. *Avena sterilis* L.** – Annual to biennial, blades 50-150 cm high, bare, panicle up to 40 cm long, one-sided, free, overbended. **Florets up to 2/3 bristles, 2-dentate, awn growing out from the back side, 4-9 cm long, noded, spirally coiled round in lower part, 25-32 x 7.4-8.6 mm. Caryopses cylin-**



dric, planoconvex, ventral side with longitudinal furrow, 6-8 x 2-2.6 mm. Surface dense hirsute, lustreless, yellowish.  $2n = 42$ . Native to southern Europe; hauling into the Carpathians in lawns and waste places.

**4543. *Avena strigosa*** Schreb – Annual, blades erect, 35-100 cm high, sheaths of leaves hirsute or bare. Florets oblong ovoid-lanceolate, lemma at apex and 2 membranous teeth short hirsute, bottom and rachilla bare or only coarse, awn in bottom part spiral coiled around the rest coarse, 13-15 x 1.8-2.2 mm. Caryopses ellipsoid, concavo-convex, dorsal side 5-veinous, slight lustrous, apex hairy, 6-7 x 1.5-1.7 mm. Surface dark-brown.  $2n = 14$ . Native to western Europe (perhaps originated from *A. longiglumis* or *A. barbata*); hauling to Carpathians or growing as weed in cereals.

**4544. *Helictotrichon decorum*** (Janka) Henrard, *Avena decora* Janka – Perennial, strongly stoloniferous, blades slender, erect, 35-90 cm high. Florets prolonged  $\pm$  cylindric, lemma smooth or with short hirsute veins, apex membranous, bottom ciliate, awn spiral coiled around in below half, 7.5-8.5 x 1.2-1.4 mm. Caryopses ellipsoid, biconvex, transversal section round, longitudinal furrow on ventral side slight distinct, apex hairy, 4.2-4.6 x 1.1-1.3 mm. Surface smooth, lustreless, straw-coloured. Native to the East Carpathians, calcareous rocky places of upland and montane zones. Ro.

**4545. *Avenula besseri*** Koczwara, *Avenastrum besseri* (Gris.) Koczwara – Perennial, blades 30-50 cm high, densely tufted in sheaths at base. Florets oblong-ellipsoid, lemma smooth, 2-dentate, awn 3-6 mm long, rachilla short and bare, 4-4.6 x 0.7-0.8 mm. Caryopses ellipsoid, concavo-convex, with longitudinal furrow on ventral side, 1.5-1.8 x 0.6-0.7 mm. Surface faint waved, slight lustrous, reddish to dark-brown, often violetish above. Native to Europe, steppes and rocks. Pl.

**4546. *Avenula planiculmis*** (Schr.) Sauer et Chmelitschek, *Avenastrum planiculme* (Schr.) Opiz – Perennial, free-tufted, longly (up to 10 cm) spurred, blades thick, stiff, erect, 7-100 cm high, compressed above. Florets oblong-ellipsoid, lemma upper part membranous, rest distinct veinous, rachilla long-ciliate, awn lower part spiral coiled around, fine articulated above, 5.3-6 x 1.6-2 mm. Caryopses  $\pm$  ellipsoid, planoconvex, ventral side

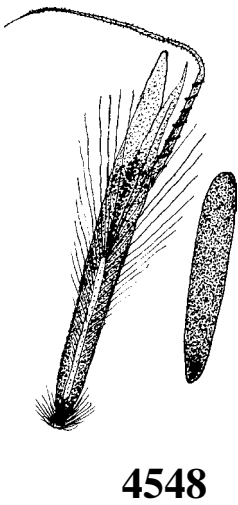
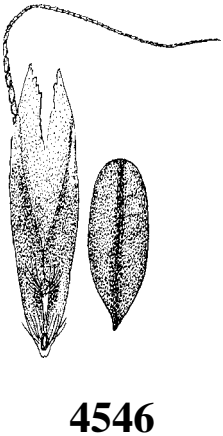
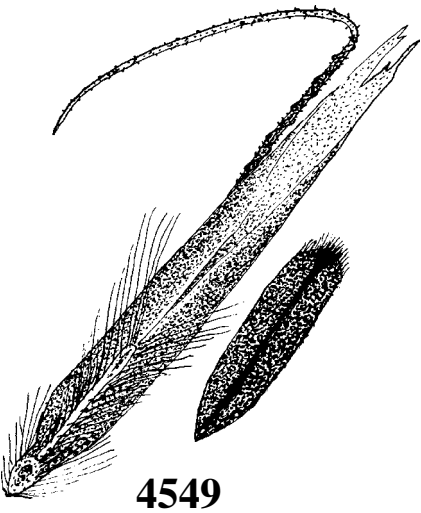
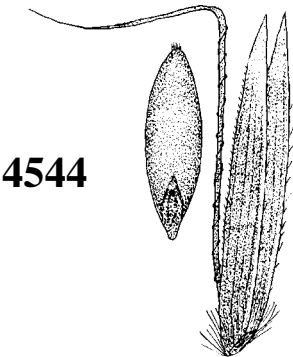
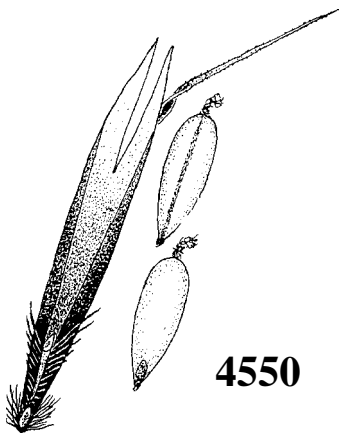
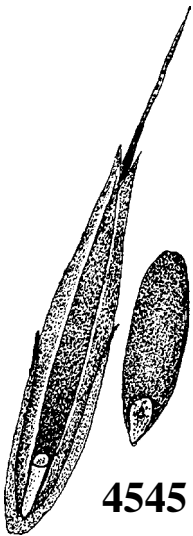
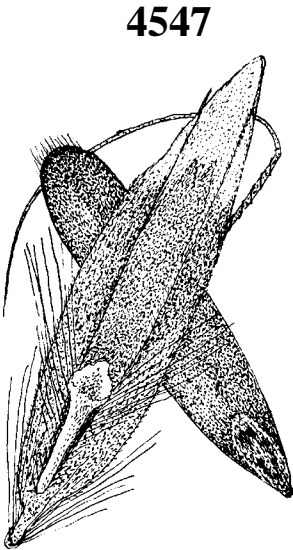
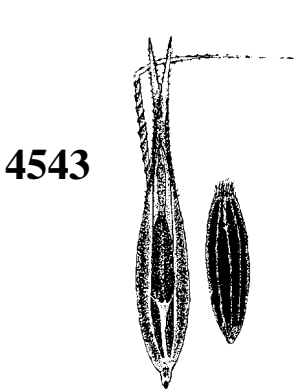
with longitudinal furrow, 4-5 x 1.4-1.5 mm. Surface pale-brown.  $2n = 126$ . Native to Europe, forest clearings and shrubberies, mountain planes. Cz, Pl, Ro, Sk.

**4547. *Avenula praeusta*** (Rchb.) Holub, *Avena praeusta* Rchb. – Perennial, free-tufted, bare, with short spurs, blades stiff erect, 60-130 cm high, compressed below. Florets ellipsoid, lemma at base distorted, adpressed, long-ciliated, awn in lower part spiral coiled around, 11-15 x 1.4-1.6 mm. Caryopses cylindric, planoconvex, 3-angular, ventral side longitudinal furrowed, apex hairy, 4.4-4.7 x 0.9-1.1 mm. Surface longitudinal faint striate, slight lustrous, pale-brown.  $2n = 126$ . Native to Europe, sunny, stony and rocky slopes, forest steppes and clearings. Hu, Ro, Sk, Uk.

**4548. *Avenula pratensis*** (L.) Dumort., *Avenastrum pratense* (L.) Opiz – Perennial, densely tufted, blades stiff, erect, 30-100 cm high, scabrous above. Florets prolonged lanceolate, lemma in upper part membranous, lower part and rachilla long-ciliated, apex 2-dentate, awn below spiral coiled, coarse above, 9-12 x 0.9-1.1 mm. Caryopses oblong-cylindric, concavo-convex, apex roundish, bottom narrowed into hilum, 5.2-5.8 x 0.8-1 mm. Surface smooth, slight lustrous, straw-coloured.  $2n = 126$ . Native to Europe, sunny, grassy slopes and hills, steppe meadows. Br, Hu, Pl, Ro, Sk.

**4549. *Avenula pubescens*** (Huds.) Dumort., *Helictotrichon pubescens* (Huds.) Pilger – Perennial, free-tufted with short spurs, blades 30-110 cm high, erect or ascendent, smooth. Florets prolonged spindle-shaped, lemma bare, upper part membranous, bottom and rachilla ciliate, awn 12-20 mm long, lower part spiral coiled around, 12-15 x 1.3-1.5 mm. Caryopses  $\pm$  ellipsoid, concavo-convex, compressed, apex hairy, 4-6 x 1.2-1.4 mm. Surface glabrous, slight lustrous, greyish-brown.  $2n = 14$ . Native to Eurasia, meadows, shrubberies, slopes and forest clearings; in all Carpathian regions.

**4550. *Avenula versicolor*** (Vill.) Lainz, *Avenochloa versicolor* (Vill.) Holub – Perennial, laxly tufted, spurs extrasheath, blades erect, 15-50 cm high, thin, slightly scabrous only above. Florets prolonged lanceolate, lemma membranous above, 2-dentate, awn in lower part spiral coiled around, crooked, upper part coarse, rachilla long ciliate, 9-11 x 0.9-1.3 mm. Caryopses cylindric, planoconvex, ventral side longitudinal furrowed, 3.4-3.6 x 1-1.1 mm. Surface smooth, straw-coloured.  $2n = 14$ .



Native to the Alps and the Carpathians, high-mountain meadows, overgrown rocks and reinforced screes. Pl, Ro, Sk, Uk.

**4551. *Avenella flexuosa* (L.) Drejer, *Deschampsia flexuosa* (L.) Trin.** — Perennial, tufted, blades erect, 20-100 cm high, smooth, lustrous, sheaths of leaves  $\pm$  smooth, often brownish-red. **Florets oblong-ellipsoid, lemma on apex truncate or slight dentate, ciliate at bottom, awn about 5 mm, longer than the caryopsis, coarse, 4-4.6 x 0.9-1 mm. Surface coarse. Caryopses ellipsoid, convexo-convex, without or with indistinct longitudinal furrow, 2-2.4 x 0.6-0.7 mm. Surface longitudinal striate, lustrous, pale-brown. 2n = 28.** Native to Eurasia, light woods, pastures, heath-clad slopes. Br, Hu, Pl, Ro, Sk, Uk.

**4552. *Arrhenatherum elatius* (L.) P. Beauv., *Avena elatior* L.** — Perennial, free-tufted, blades erect or shortly ascendent, 50-180 cm high, smooth, lustrous, sheaths of leaves scabrous, bare or scarcely hirsute. **Florets (left) ovoid-lanceolate, lemma 5-9-veinous, shortly 2-dentate, awn in lower half spiral coiled around, the other half coarse, 8-9 x 1.5-1.7 mm. Surface of lemma bare or scarce hirsute. Caryopses (right) ellipsoid, convexo-convex, ventral side indistinct furrowed, 3.1-3.3 x 1.1-1.3 mm. Surface hirsute, yellowish-brown. 2n = 28.** Native to Europe, meadows, boundaries, grassy slopes, forest margins and clearings; in all Carpathian regions.

**4553. *Aira caryophylla* L.** — Annual, minutely tufted, blades erect, 10-45 cm high, thin, smooth or slightly scabrous. **Florets ovoid-lanceolate, lemma very thin, transparent, connected with exocarp, upper part whitish hirsute, middle and bottom parts coarse, short ciliate around hilum, awn as long as the fruit, 1-1.3 x 0.2-0.35 mm. Caryopses ovoid, concavo-convex, 0.9-1 x 0.2-0.3 mm. Surface coarse, lustreless, dark-brown. 2n = 14.** Native to Europe, sandy and loamy pastures, fallows, rocks, boundaries and embankments. Br, Hu, Pl, Ro, Sk, Uk.

**4554. *Aira elegantissima* Schur, *A. capillaris* Host non al.** — Annual, minutely tufted, blades erect or ascendent, thin, 6-35 cm high, sheaths of leaves scabrous. **Florets lanceolate, lemma very thin, transparent, connected with exocarp, apex 2-dentate, awn as long as the floret, bottom short-ciliated, 1.1-1.3 x 0.3-0.4 mm. Surface coarse, lustrous, dark-brown. Caryopses lanceolate, 0.8-1 x 0.2-0.3 mm. 2n = 14.** Native to Europe,

sunny and stony slopes, dry fallows, fields, boundaries and forest margins. Ro, Sk.

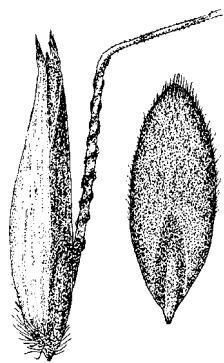
**4555. *Aira praecox* L.** — Annual, blades 5-20 cm high, stiff erect, smooth, thin, sheaths of leaves smooth, downy. **Florets ovoid-lanceolate, lemma short laciniate at base, whole surface coarse, apex 2-dentate, 1/3 of keel with coarse awn, 2-2.5 x 0.4-0.5 mm. Caryopses ellipsoid, planoconvex, 1.6-1.8 x 0.4-0.45 mm. Surface longitudinal striate, lustrous, upper part pale, bottom dark-brown. 2n = 14.** Native to Europe, sandy pastures, roads, fallows, boundaries and waste places. Pl.

**4556. *Eleusine indica* (L.) Gaertn.** — Annual, caespitose, stems 10-30 cm high, ascending, inflorescence of 2-4 dense spikes, 1.5-3.5 cm x 2-3 mm each. **Florets ovoid, with acute apex, lemma ovate-lanceolate, concave, strong keeled, 3.8-4.2 x 1.4-1.6 mm. Caryopses ellipsoid, 1.2-1.4 x 0.8-0.9 mm. Surface wrinkly, lustreless, brownish-red.** Native to tropic and subtropic zones, roadsides and disturbed grounds; rarely hauling into the South Carpathians. Ro.

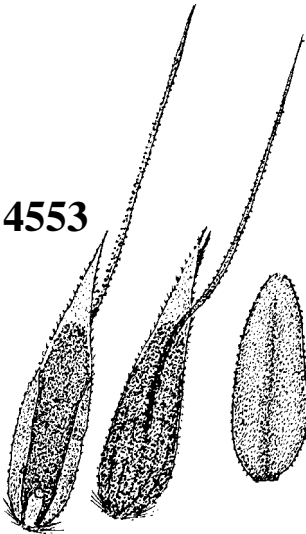
**4557. *Hordelymus europaeus* (L.) Jess. ex Harz, *Elymus europaeus* L.** — Perennial, tufted, stems shortly ascendent, erect 50-110 cm high, bare, smooth, rough above. **Florets oblong-ellipsoid, lemma bare, 5-veinous, awns 20-25 mm long, both shortly hirsute, 9-12 x 1.6-2 mm. Caryopses cylindric, planoconvex, ventral side longitudinally furrowed, 6.5-7.5 x 1.6-1.8 mm. Surface longitudinal striate, lustreless, brown. 2n = 28.** Native to Europe, shady leafy woods and shrubberies, dispersed in montane zone. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4558. *Deschampsia caespitosa* (L.) P. Beauv., *Aira caespitosa* L.** — Perennial, densely and stiff-tufted, blades numerous, erect, 30-200 cm high, smooth, sometimes scabrous under panicle. **Florets ovoid, lemma truncate or dentate above, ciliate below, palea margins serrate, awn coarse, 2.6-3.1 x 0.7-0.9 mm. Caryopses ellipsoid, round in transversal section, longitudinal furrow slight distinct, 1.5-1.7 x 0.6-0.7 mm. Surface longitudinal striate, slight lustrous, violetish-brown. 2n = 26.** Native to circumpolar territories, moist meadows, pastures and forest boundaries; in all Carpathian regions.

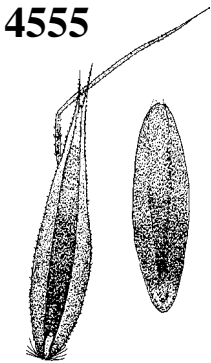
**4559. *Roegneria canina* (L.) Nevski, *Agropyron caninum* (L.) P. Beauv., *Triticum caninum* L.** — Perennial, free tufted, stems 30-110 cm high, erect



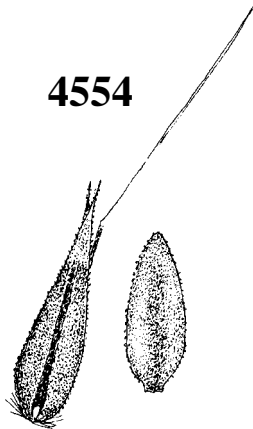
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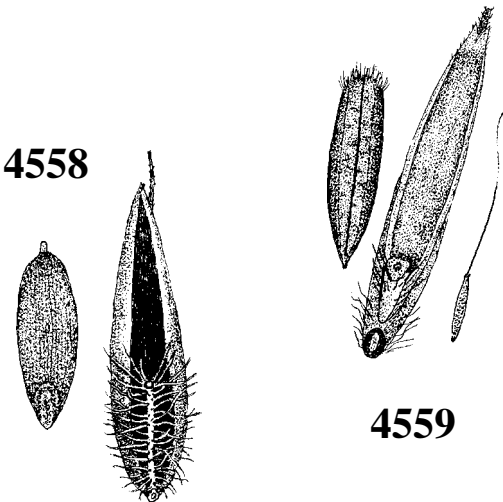
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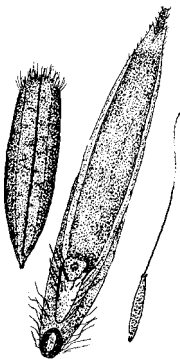
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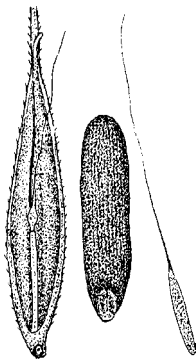
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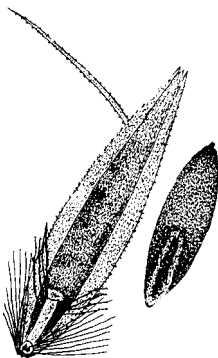
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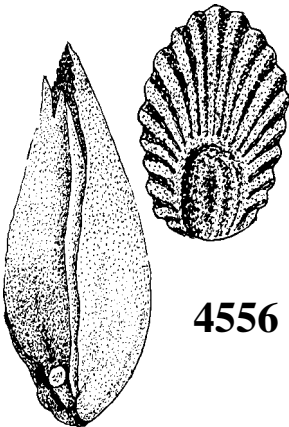
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or ascendent, slender, bare, smooth or rarely rough above. **Florets ellipsoid, lemma bare, 5-veinous, apex with 7-15 mm long awn, short hirsute, bottom strong ciliate, 10-12 x 1.7-1.9 mm. Caryopses ± cylindric, planoconvex, ventral side longitudinal furrowed, apex hairy, 6.5-7.5 x 1.6-1.8 mm. Surface longitudinal striate into hilum. 2n = 28.** Native to Eurasia, shady woods, littoral shrubberies, lowland forests and cut-over areas. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4560. *Eremopyrum orientale* (L.) Jaub. et Spach, *Agropyron orientale* (L.) Roemer et Schultes** – Annual, stems 7-30 cm high, leaves 3-6 cm x 2-3 mm, scabrous, sometimes with puberulent upper surface. **Florets with glumes, lanceolate, lemma as long as glumes, hispid, 10-16 x 1.4-1.6 mm (including awn). Caryopses ± cylindric or slight spindleshaped, concavo-convex, apex hairy, 5-5.3 x 0.8-1 mm. Surface smooth, lustreless, pale-brown.** Native to southeastern Europe, steppes and semideserts. Br, Mo, Ro, Uk.

**4561. *Elymus trachycaulus* (Link) Gould ex Shinners, *Roegneria trachycaulon* (Link) Nevski** – Perennial, tufted, stems 50-100 cm high, sheaths of leaves ± bare. **Florets prolonged ellipsoid, lemma on apex membranous bordered, awn short, hirsute, bottom ciliate, 9-10 x 1.4-1.6 mm. Surface straw coloured. Caryopses cylindric, planoconvex, ventral side longitudinal furrowed, apex hairy, 6-6.5 x 1.2-1.4 mm. Surface longitudinal faint striate, dull. 2n = 28.** Native to North America; in the Carpathians rarely cultivated for fodder. Br, Mo, Uk.

**4562. *Elytrigia intermedia* (Host) Nevski, *Triticum truncatum* Wallr., *Elymus truncatus* (Wallr.) Melderis** – Perennial, stems erect, 40-110 cm high, stiff, sheaths of leaves bare. **Florets ellipsoid, lemma with keel on apex, obtuse, with point or short awn, 8-9 x 1.6-1.9 mm. Caryopses cylindric, planoconvex, ventral side with longitudinal furrow, apex hairy, 5-6 x 1.4-1.6 mm. Surface wrinkly, dull, reddish-brown. 2n = 42.** Native to Eurasia, sunny, stony, shrubby and semisteppe slopes, vineyards, boundaries and pine-woods on sands; in all Carpathian territories.

**4563. *Elytrigia repens* (L.) Desv., *Triticum repens* L., *Agropyron repens* (L.) P. Beauv.** – Perennial, stems 30-120 cm high, erect, smooth, sheaths of leaves bare. **Florets ellipsoid, lemma bare, keeled, awnless or with short awn above, 6.5-7.5 x 1-1.4 mm. Caryopses cylindric, planoconvex, ventral side with**

**longitudinal furrow, apex hairy, 4.2-4.8 x 1-1.1 mm. Surface longitudinal striate, slight lustrous, brown. 2n = 42.** Native to Eurasia, fields, meadows, pastures, gardens, roads, waste places; throughout the Carpathians.

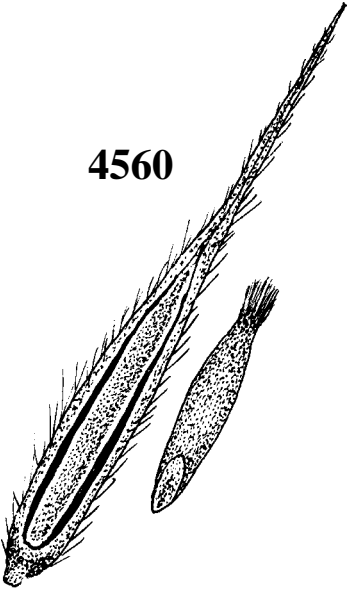
**4564. *Agropyron elongatum* (Host) P. Beauv., *Triticum elongatum* Host** – Perennial, densely tufted, stems erect, 30-140 cm high. **Florets oblong-lanceolate, lemma glabrous rare faint pubescent on apex, awnless, rachilla short coarse, 10-11 x 2-2.3 mm. Caryopses cylindric, planoconvex, ventral side with longitudinal furrow, apex hairy, 5.6-6 x 1.6-2 mm. Surface longitudinal striate, slight lustrous, brown.** Native to Eurasia, sandy and slightly saline, especially marine dunes. Mo, Ro, Uk.

**4565. *Agropyron junceum* (L.) P. Beauv., *Triticum junceum* L.** – Perennial, stems erect, rigid, 30-80 cm high. **Florets prolonged ellipsoid, lemma awnless, smooth, rachilla short, thick, 12-16 x 1.9-2.1 mm. Caryopses cylindric, planoconvex, ventral side with longitudinal furrow, apex hairy, 7.8-8.2 x 1.6-1.8 mm. Surface longitudinal striate, lustreless, brown. 2n = 42.** Native to Eurasia, littoral marine sands. Pl, Ro.

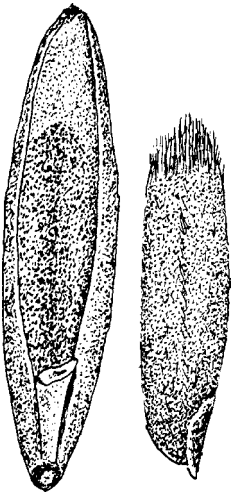
**4566. *Agropyron pectinatum* (M. Bieb.) P. Beauv., *A. cristatum* auct. non (L.) Gaertn.** – Perennial, tufted, stems erect or nodular ascendent, 30-60 cm high, leafed up to apex, sheaths of leaves smooth. **Florets ellipsoid, lemma with keel, 3-veinous, abrupt narrowed into short (2-3 mm) awn, 5-6 x 0.9-1 mm. Surface hirsute. Caryopses cylindric, planoconvex, ventral side with longitudinal furrow, apex hairy, 2-3 x 0.7-0.8 mm. Surface longitudinal striate, dull, pale-brown. 2n = 14, 28, 42.** Native to Eurasia, dry, sunny and sandy places of pastures and fallows, boundaries, hills and grassy slopes. Hu, Mo, Pl, Ro, Sk, Uk.

**4567. *Agropyron pectiniforme* Roem. et Schult., *Bromus cristatus* L.** – Perennial, densely tufted, stems 40-80 cm high, erect or ascendent, glabrous or hirsute in lower part. **Florets oblong-lanceolate, lemma and awn smooth, palea-border fine hirsute, 5.5-6 x 1-1.2 mm. Caryopses cylindric, planoconvex, ventral side longitudinal furrowed, 3-3.4 x 0.9-1.1 mm. Surface longitudinal striate, slight lustrous, dark-brown.** Native to Eurasia, dry, arid and grassy steppes, sunny coasts, calcareous sands in the lowland zone. Mo, Ro, Sk.

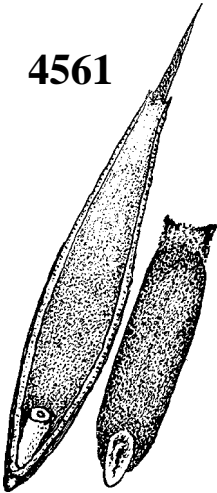




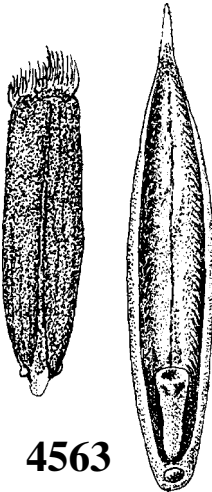
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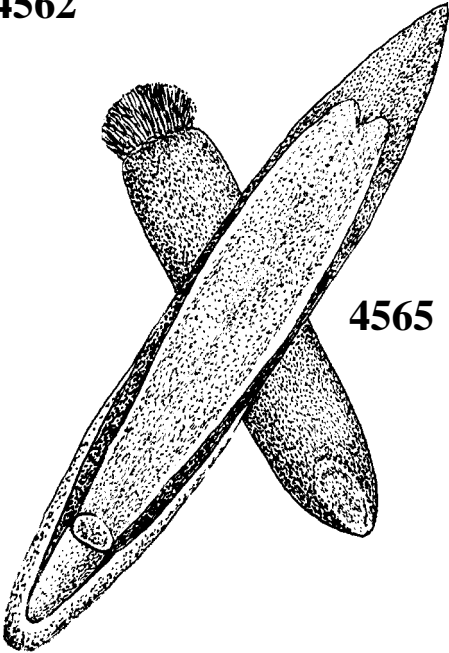
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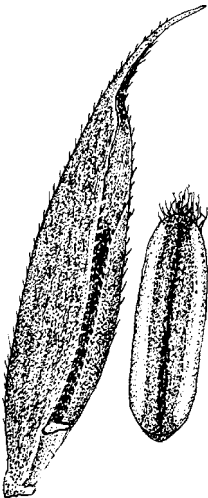
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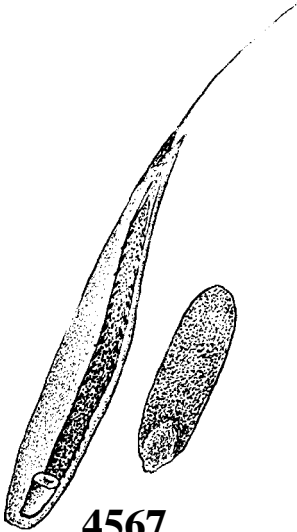
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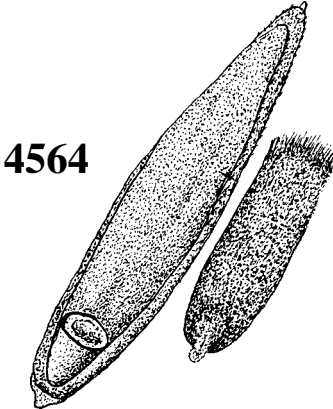
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**4568. *Agropyron trichophorum*** (Link) Richt., *A. intermedium* subsp. *trichophorum* (Link) Aschers. et Graebn. — Perennial, stems 60-100 cm high, upper surface long-haired and scabrid, sometimes also beneath. **Florets (left) oblong-lanceolate, lemma upper part sometimes hairy, awnless, 9-11 x 1.9-2.1 mm. Surface straw-coloured. Caryopses (right) cylindric, concavo-convex, apex with whitish stylopodium, 5.5-6 x 1.5-1.7 mm. Surface smooth, lustreless, pale-brown. 2n = 42 (28).** Native to Eurasia, low shrubberies, wood margins and sunny places on calcareous grounds. Hu, Mo, Pl, Ro.

**4569. *Dasypyrum villosum*** (L.) Candargy, *Haynaldia villosum* (L.) Schur, *Secale villosum* L. — Annual, tufted, stems 20-100 cm high, erect or shortly ascendent, bare, leaves feeble. **Florets obovoid, lemma sharp keeled, with 7-60 mm long, rough and at base ciliate awn, 5-8 x 1.5-2.3 mm. Caryopses cylindric, planoconvex, 3-angular, ventral side longitudinal furrowed, apex whitish hairy, 2-3 x 1.7-1.9 mm. Surface longitudinal faint striate. 2n = 14.** Native to southern Europe, rarely and transiently hauling into dumps, railway stations and rubbish heaps. Hu, Mo, Ro, Uk.

**4570. *Secale cereale*** L. — Annual to biennial, stems 60-150 cm high, tufted, bare, downy above, sheaths narrow, bare. **Caryopses oblong-cylindric planoconvex, ventral side with longitudinal furrow, apex faint hairy, bottom narrowed into hilum, 7-8.5 x 2.5-3 mm. Surface fine, longitudinal striate, lustreless, greyish or pale-brown. 2n = 14.** Native to Eurasia, a cereal grown since ancient times and originated from South-European *S. montanum* Guss. or Asian *S. ancestrale* Žukovskij, moist neutral, to slightly acid, loamy and sandy soils; in all Carpathian areas commonly cultivated since the Bronze Age.

**4571. *Secale montanum*** Guss., *S. dalmaticum* Vis. — Perennial, stems numerous, erect or ascendent, branched from base, 80-100 cm high. **Caryopses cylindric, planoconvex, 3-angular, dorsal side rooflike, ventral with longitudinal furrow, apex hairy, bottom narrowed into hilum, 7-8 x 1.5-2 mm. Surface longitudinal striate, lustreless, orange-brown.** Native to the Mediterranean, calcite rocks and screes of the montane zone. Ro.

**4572. *Secale sylvestre*** Host, *Triticum campestre* Kit. — Annual, stems up to 50 cm high, tuftly ramified at base, nodules ascendent, densely hirsute above.

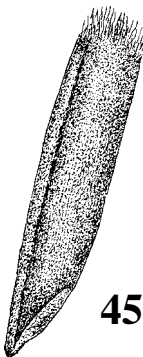
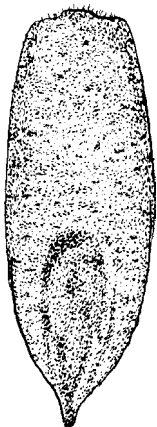
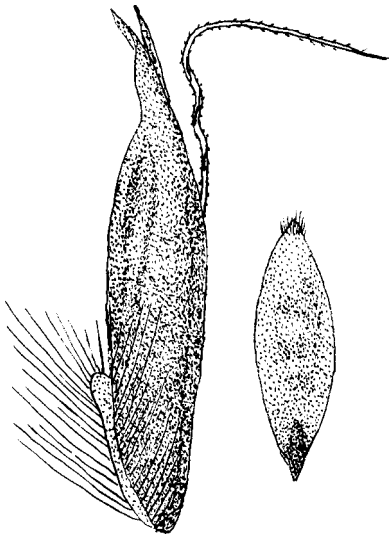
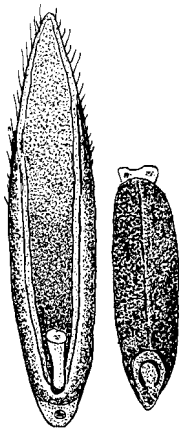
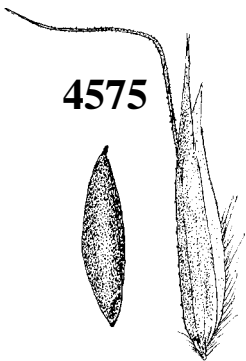
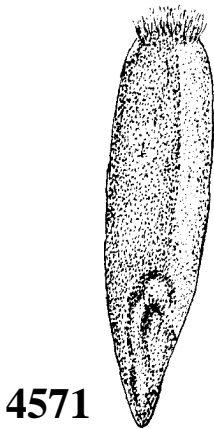
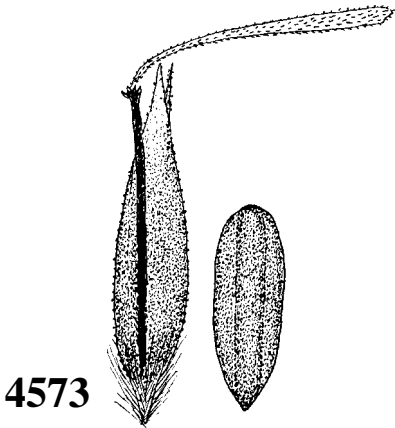
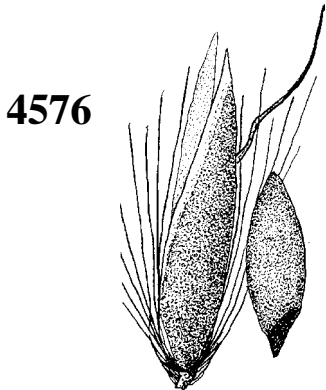
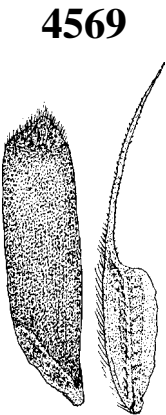
**Caryopses cylindric, lateral flattish, dorsal side rooflike, ventral flat with longitudinal furrow, apex bristly, bottom aslant cutting down, 8-9 x 1.6-2 mm. Surface longitudinal striate, slight lustrous, tobacco-brown. 2n = 14.** Native to Eurasia, sandbanks and sandy grounds of the lowland zone. Hu, Mo, Ro, Uk.

**4573. *Corynephorus canescens*** (L.) P. Beauv., *Weingaertneria canescens* (L.) Bernh. — Perennial, densely tufted, tufts crumbly, blades numerous, erect, 15-50 cm high, smooth or scabrous above, nodules dark-violet. **Florets ellipsoid, lemma coarse, apex membranous, 2-dentate, bottom rich ciliate, lower half of awn erect, dark-brown, upper half clavate, coarse or short hirsute, whitish, rachilla ciliate, 1.7-2 x c. 0.35 mm. Caryopses ellipsoid, concavo-convex, lustrous, 1-1.1 x c. 0.4 mm. Surface dark-brown. 2n = 14.** Native to Europe, sandbanks, roads, embankments, walls and pine-woods. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4574. *Trisetum alpestre*** (Host) P. Beauv., *Avena alpestris* Host — Perennial, densely tufted, blades 10-30 cm high, lower 1/3-1/2 leafy with 2 nodules. **Florets (14x) oblong-ellipsoid, lemma bare, apex acuminate, 2-dentate and membranous, more than half of keel awned, rachilla long-ciliate, 4-5 x 0.9-1.1 mm. Caryopses spindle-shaped, flattish, apex hairy, 2.2-2.4 x 0.6-0.7 mm. Surface lustrous, yellowish. 2n = 14.** Native to the Alps and the Carpathians, grassy and stony slopes, screes, calcareous sites of subalpine and alpine zones. Pl, Ro, Sk, Uk.

**4575. *Trisetum flavescens*** (L.) P. Beauv., *T. pratense* Pers. — Perennial, free-tufted, blades erect, 30-140 cm high, with 4 hirsute nodules. **Florets lanceolate, lemma bare, indistinct 5-veinous, 2-dentate, more than half of keel coarse awned, rachilla long-ciliate, 4.5-5.5 x 0.6-0.7 mm. Caryopses spindle-shaped, lateral compressed, 2.5-3 x 0.5-0.6 mm. Surface wrinkly, lustrous, pale-brown. 2n = (24) 28.** Native to Europe, meadows, pastures, light shrubberies from lowland up to montane zones. Hu, Mo, Pl, Ro, Sk, Uk.

**4576. *Trisetum macrotrichum*** Hackel, *T. distichophyllum* auct. non (Vill.) P. Beauv. — Perennial, creeping wide, stoloniferous, with ascending stems, 40-70 cm high, glabrous to hairy. **Florets lanceolate, lemma lanceolate, rachis branches with dense hairs c. 3 mm or longer, awn 4-7 mm long,**



geniculate near base, twisted, 3.8-4.8 x 0.8-1 mm. Caryopses spindleshaped, lateral compressed, 2-2.3 x 0.7-0.8 mm. Surface fine longitudinal striate, lustrous, yellowish.  $2n = 28$ , 56. Native to some mountains of Europe, calcite rocks and screes. Ro, Uk.

**4577. *Gaudinia fragilis*** (L.) Beauv. — Annual or biennial, stems 15-20 cm high, usually erect or ascending, glabrous, smooth, shiny, inflorescence up to 35 cm long. Florets lanceolate, lemma glabrous or villous at apex, with a geniculate awn c. 10 mm long, 5.5-6.5 x 0.5-1 mm. Caryopses cylindric, apex with crest of hairs, 2.4-2.7 x 0.6-0.7 mm. Surface smooth, slight lustrous, yellowish.  $2n = 28$ . Native to southern Europe, grassy, usually damp habitats, rarely hauling into central Europe, including the Carpathians.

**4578. *Koeleria glauca*** (Spreng.) DC., *K. pohleana* (Domin) Gontsch. — Perennial, densely tufted, blades erect, 30-70 cm high, roundish or finely striate, thick, bare, downy above and leafless. Florets oblong-lanceolate, lemma acute or obtuse, short hirsute on keel, surface coarse, palea membranous, 2-dentate, coarse, 3.5-4 x 0.7-0.8 mm. Caryopses clubbed, lateral flat, 2.4-2.7 x 0.6-0.7 mm. Surface longitudinal faint striate, lustrous, honey-coloured.  $2n = 14$ . Native to Eurasia, dry sandbanks and sandy pine-woods, heath-clad slopes, maritime and fluvial dunes. Br, Hu, Pl, Ro, Sk, Uk.

**4579. *Koeleria lobata*** (M. Bieb.) Roemer et Schult., *K. degenii* Domin — Perennial, densely tufted, blades erect, glabrous, 20-35 cm high, bulbiformly roughened at base. Florets lanceolate, acuminate or with short (1 mm) awn, short hirsute, margins and palea hyaline, 5-5.5 x 1-1.2 mm. Caryopses club-shaped, lateral compressed, 3.3-3.7 x 0.6-0.7 mm. Surface longitudinal faint striate or smooth, slight lustrous, honey-coloured.  $2n = 28$ . Native to southeastern Europe and Asia Minor, arid grounds, calcite or granite rocks, rare on sunny sandbanks. Mo, Ro, Uk.

**4580. *Koeleria macrantha*** (Ledeb.) Shult., *K. cristata* (L.) Pers., *K. gracilis* Pers. — Perennial, densely tufted, blades erect, 20-80 cm high, slender, bare or downy beneath peduncle. Florets lanceolate, lemma smooth, acuminate, awnless, palea 2-dentate, membranous, rachilla long and smooth, 3.5-4 x 0.6-0.8 mm. Caryopses spindleshaped, lateral flat, 2.2-2.4 x 0.5-0.6 mm. Surface lustrous, pale-brown.  $2n = 14$ . Native to circumpolar terri-

tories, grassy, steppe slopes, light woods and shrub-beries, sunny rocks and sandbanks. Ro, Sk.

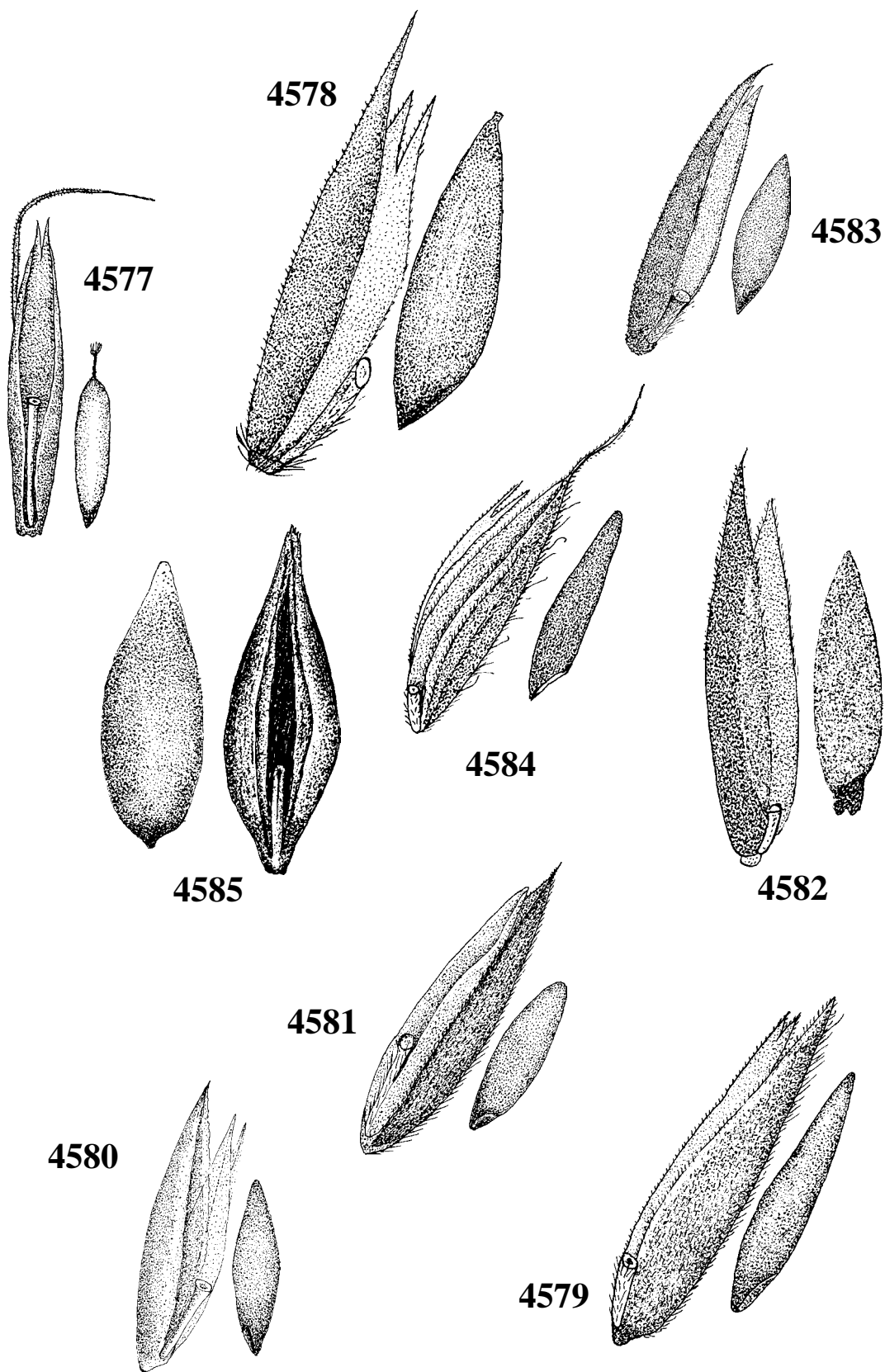
**4581. *Koeleria pyramidata*** (Lam.) P. Beauv., *K. lamarckii* Ujhelyi — Perennial, densely tufted, with long extrasheath spurs, blades erect, 45-90 cm high, very sturdy, stiff, bare or downy above. Florets lanceolate, lemma acute or with short awn, smooth or downy, hirsute at margins, palea membranous, rachilla hirsute, 4.8-5.5 x 1.1-1.3 mm. Caryopses spindleshaped, lateral compressed, 2.5-2.8 x 0.7-0.8 mm. Surface longitudinal faint furrowed, lustrous, honey-coloured.  $2n = 28$ . Native to Europe, dry, grassy and stony slopes, light pine-woods and shrubberies, pastures. Hu, Pl, Ro, Sk.

**4582. *Koeleria splendens*** C. Presl, *K. dasyphylla* Willk. — Perennial, densely caespitose, forming large compact tufts, stems 20-50 cm high, panicle 3-8 cm high, ovate-oblong, dense. Florets oblong-ellipsoid, lemma acuminate or with short awn, usually glabrous, palea acuminate, transparent, a little shorter than the lemma, 5.4-6 x 1.1-1.3 mm. Caryopses  $\pm$  spindleshaped, strong compressed, apex acute, bottom cleaved, 3.2-3.8 x 0.9-1.1 mm. Surface very fine striate, glossy, yellowish.  $2n = 28$ . Native to Europe, calcareous, sunny rocks of montane and subalpine zones. Ro, Uk.

**4583. *Koeleria tristis*** Domin — Perennial, tufts dense, blades erect, strong, 70-90 cm high, roughened at base, downy beneath panicle. Florets (left) lanceolate, lemma acuminate or with short awn, coarse, palea 2-dentate, membranous, lustrous, 5.4-5.8 x 1-1.2 mm. Caryopses (right) spindle-shaped, lateral compressed, 2.8-3.2 x 0.8-0.9 mm. Surface lustrous, honey-coloured.  $2n = 70$ . Native to West Carpathians, calcite rocks. Sk.

**4584. *Lophochloa cristata*** (L.) Hyl., *Festuca cristata* L. — Blades numerous, erect or ascendent, 5-70 cm high, bare, leafy. Florets ovoid-lanceolate, lemma acuminate, margins and apex membranous, 5 veins hirsute up to ciliate, interveinal space coarse, awn 1-2 mm long, coarse, apex hirsute, 2.7-3.1 x 0.8-1 mm. Caryopses clubbed, lateral flat-tish, 1.8-2 x 0.3-0.4 mm. Surface smooth, lustrous, honey-coloured.  $2n = 26$ . Native to the Mediterranean; rarely hauling into the Carpathians.

**4585. *Holcus lanatus*** L. — Perennial, densely tufted, without spurs, blades numerous, 20-100 cm high, erect or ascendent, nodules softly hirsute. Florets



broad spindleshaped, lemma bare, high lustrous, margins rare ciliate in upper part, apex thin, bare, greyish-white, 2.2-2.5 x 0.7-0.9 mm. Caryopses  $\pm$  club-shaped, apex gradually narrowed, bottom roundish with hilum, 1.9-2.1 x 0.7-0.8 mm. Surface longitudinal faint striate, slight lustrous, reddish-brown.  $2n = 14$ . Native to Europe, moist meadows and pastures, forest margins and cleared areas; in all Carpathian territories.

**4586. *Holcus mollis* L.** – Perennial, tuftless, blades erect or ascendent, 20-100 cm high, nodules hirsute, sheaths of leaves downy. Florets lanceolate, lemma bare, poor hairy at apex, upper 1/3 with 3.5-5 mm long awn, 2-2.3 x 0.6-0.7 mm. Surface high lustrous, greyish-white. Caryopses prolonged, obovoid, planoconvex, 1.5-1.9 x c. 0.5 mm. Surface longitudinal furrowed, brown.  $2n = 28$  (35, 42, 49). Native to Europe, forest margins and shrubberies, cleared areas, fallows, fields; throughout the Carpathians.

**4587. *Hierochloë australis* (Schr.) Roem. et Schult., *Holcus australis* Schrad** – Perennial, tufted, blades 30-80 cm high. Florets (left) spindleshaped, lemma bare, scarce ciliate in upper part, awnless, apex ventral side ciliate, 3.2-3.6 x 0.9-1.1 mm. Surface longitudinal faint striate, high lustrous, purplish-brown. Caryopses (right) obovate with rest of the stigma at apex, bottom narrowed, round in transversal section, 1.3-1.5 x 0.6-0.7 mm. Surface wrinkly, lustrous, pinkish-brown. Native to Europe, light woods and forest steppes. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4588. *Hierochloë odorata* (L.) P. Beauv., *H. borealis* (Schr.) Roem. et Schult.** – Perennial, tuftless, rhizome creeping, with spurs, blades  $\pm$  single, 20-90 cm high, sheaths of leaves smooth. Florets broad spindleshaped, lemma bare, hirsute at apex, sparse ciliate at bottom, awnless, 3.1-3.5 x 0.9-1.1 mm. Caryopses  $\pm$  obovate, apex with rest of the stigma, bottom gradually narrowed, 1.4-1.6 x 0.7-0.9 mm. Surface corrugated, lustreless, dark-brown.  $2n = 28, 42$ . Native to circumpolar areas, meadows, muddy riverbanks, moist to wet grounds; in the whole Carpathians.

**4589. *Hierochloë repens* (Host.) P. Beauv., *H. odorata* subsp. *pannonica* Chrtek et V. Jirásek** – Perennial, tuftless, blades 45-90 cm high, with numerous sheaths at base. Florets prolonged  $\pm$  ellipsoid, lemma bare, ciliate at apex, awnless, 3.3-3.7

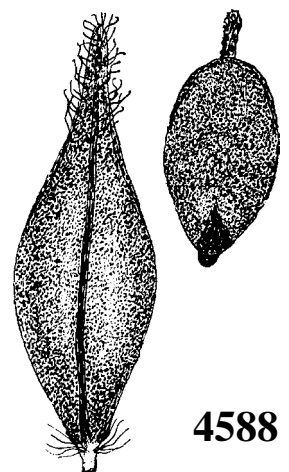
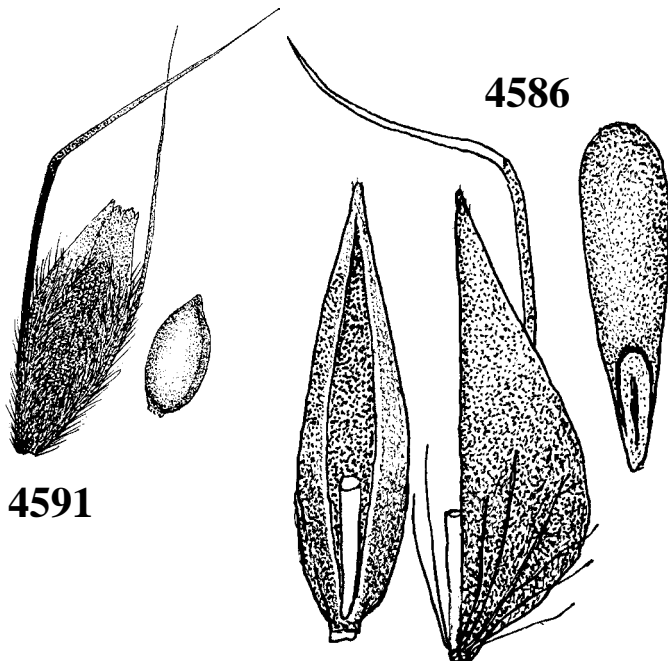
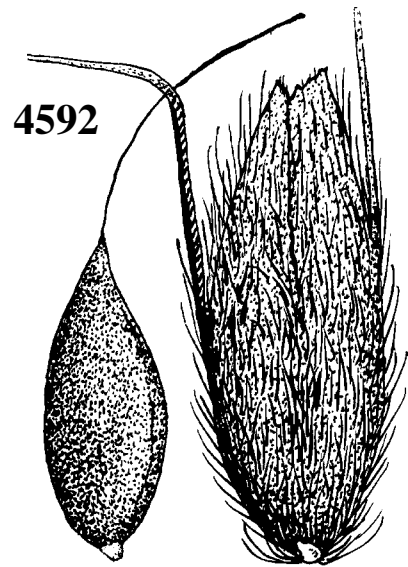
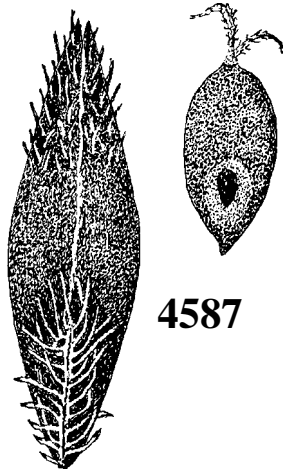
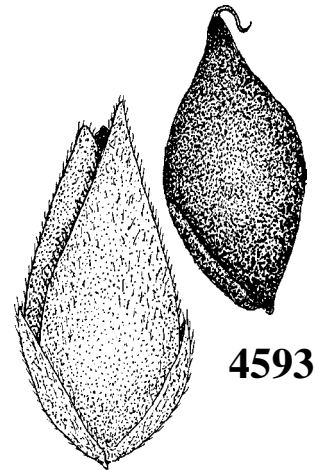
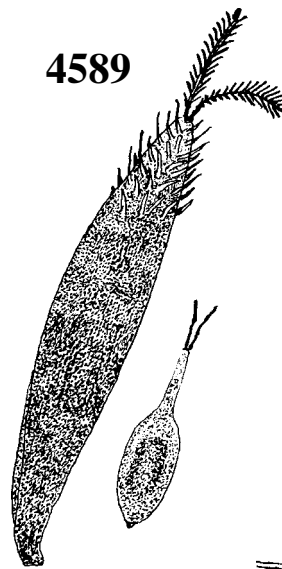
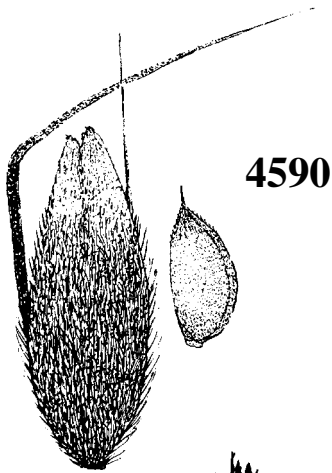
x 0.6-0.7 mm. Caryopses ellipsoid, flattish, 1.2-1.5 x 0.4-0.5 mm. Surface dull, dirty-pinkish.  $2n = 28$ . Native to Eurasia, sandbanks, light pine-woods and shrubberies. Ro, Sk, Uk.

**4590. *Anthoxanthum alpinum* Á. et D. Löve** – Perennial, tufted, blades erect, 20-80 cm high. Florets ellipsoid having 2 lemmas as in *A. odoratum*, 3.5-4 x 1.2-1.4 mm. Surface dense and long hirsute, apex short hirsute, margins ciliate. Caryopses ovoid, planoconvex with longitudinal furrow, apex shortly hirsute, sometimes with rest of the stigma filament, 1.3-1.5 x 0.6-0.8 mm. Surface longitudinal faint striate and pitted, lustrous, dark-brown.  $2n = 10$ . Native to Eurasia, high-mountain ridges and meadows, reinforced screes and stony slopes. Sk.

**4591. *Anthoxanthum aristatum* Boiss., *A. puelii* Lecoq et Lamotte** – Annual, blades at base branched and ascendent, 5-60 cm high, sheaths of leaves hirsute. Florets ellipsoid having 2 lemmas, 3-3.5 x 1-1.2 mm. Surface like in *A. odoratum*. Caryopses ellipsoid, slight flattish, 1.2-1.4 x 0.6-0.8 mm. Surface longitudinal faint striate and mammillate, lustrous, dark-brown.  $2n = 10$ . Native to the Mediterranean; occasionally hauling into the Carpathians. Pl, Sk.

**4592. *Anthoxanthum odoratum* L.** – Perennial, tufted, blades numerous, erect, 20-100 cm high, smooth, scarcely leafy, sheaths of leaves smooth, bare or downy. Florets (right) ellipsoid, with 2 lemmas surrounding the caryopsis, one with sharp bent awn, the other one with weaker, shooter and erect awn, 2.5-3.5 x 1-1.4 mm. Surface dense and long hirsute, ciliate at margins. Caryopses (left) ellipsoid, slight flattish, apex with long filament of stigma, 1.6-2 x 0.6-0.8 mm. Surface smooth, longitudinal faint striate, strong lustrous, dark-brown.  $2n = 20$ . Native to Eurasia, meadows, pastures, light woods, boundaries and lawns; in all Carpathian territories.

**4593. *Phalaris brachystachys* Link, *P. nitida* K. B. Presl** – Annual, blades up to 100 cm high, ascendent, lower nodules rooting down. Florets broad lanceolate, lemma acuminate, upper part and margins hirsute, awnless, 4.5-5.5 x 2.1-2.3 mm. Surface high lustrous, straw or pale-brown. Caryopses rhomboid, lateral compressed, 4-5 x 1.8-2 mm. Surface longitudinal faint striate, slight lustrous, dark-brown.  $2n = 12$ . Native to southern Europe; rarely hauling into the Carpathians.



4591

**4594. *Phalaris caerulescens*** Desf. — Perennial, blades 70-100 cm high, bulbly roughened at base, up to 10 mm in diam., sheaths of leaves smooth. **Florets ovoid-lanceolate, lemma acuminate, distinct veinous, awnless, 3.6-4 x 1.5-1.7 mm. Surface glabrous, high lustrous, greyish, straw-coloured. Caryopses ellipsoid, lateral slight compressed, apex with beak, 2.8-3.2 x 1.2-1.4 mm. Surface longitudinal faint striate, slight lustrous, pale-brown. 2n = 14, 28.** Native to the Mediterranean; rarely hauling in the Carpathian railway stations and dumps.

**4595. *Phalaris canariensis*** L. — Annual, blades 20-120 cm high, erect, ramified at base, stiff, smooth, sheath of leaves slightly scabrous. **Florets broad lanceolate, lemma adpressed hirsute, acuminate, awnless, 4.5-5 x 2.1-2.3 mm. Surface lustrous, straw-coloured. Caryopses ellipsoid or rhomboid, lateral compressed, 4.1-4.5 x 1.8-2 mm. Surface longitudinal faint striate, slight lustrous, dark-brown. 2n = 12.** Native to southern Europe; sometimes sowed in the Carpathians as bird-seed in parks and lawns, often hauling.

**4596. *Phalaris paradoxa*** L. — Annual, tufted, blades 30-60 cm high, ramified at base, smooth, only beneath nodules scabrous, sheaths of upper leaves smooth, bare, inflated, lower one scabrous. **Florets ovoid-lanceolate, lemma acuminate, awnless, 3.1-3.5 x 1.5-1.7 mm. Surface distinct veinous, strong lustrous, greenish pale-brown. Caryopses ellipsoid, lateral compressed, 2.4-2.6 x 1.2-1.4 mm. Surface longitudinal faint striate, slight lustrous, pale-brown, apex blackish. 2n = 14.** Native to the Mediterranean; rarely hauling into the Carpathians.

**4597. *Phalaroides arundinacea*** (L.) Rauschert, *Phalaris arundinacea* L. — Perennial, blades erect, 50-300 cm high, robust, stiff, smooth, scaly at base, sheaths of leaves smooth, narrow. **Florets ovoid-lanceolate, lemma acuminate, ribbed, scarce dense whitish hirsute, awnless, 3-3.5 x 1-1.2 mm. Surface high lustrous, straw to dark-brown. Caryopses broad obovoid, slight flattish, with small beak at apex, 1.1-1.3 x 0.8-1 mm. Surface longitudinal faint striate, dull, dark-brown. 2n = (14), 28 (42).** Native to circumpolar territories, stream banks, wet meadows, river reed overgrowths, lowland woods. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4598. *Milium effusum*** L. — Perennial, tuftless, blades erect, 50-180 cm high, smooth, lustrous, sheaths of

leaves smooth. **Florets obovoid, lemma 5-veinous, awnless, 2.4-2.8 x 1-1.3 mm. Surface leathery, longitudinal striate, high lustrous, pale-brown. Caryopses oval, slight compressed, 1.7-1.9 x 1-1.2 mm. Surface longitudinal faint striate or slight wrinkly, slight lustrous, violetish-brown. 2n = 28.** Native to circumpolar territories, shady humous woods and shrubberies, lowland forests; in all Carpathian regions.

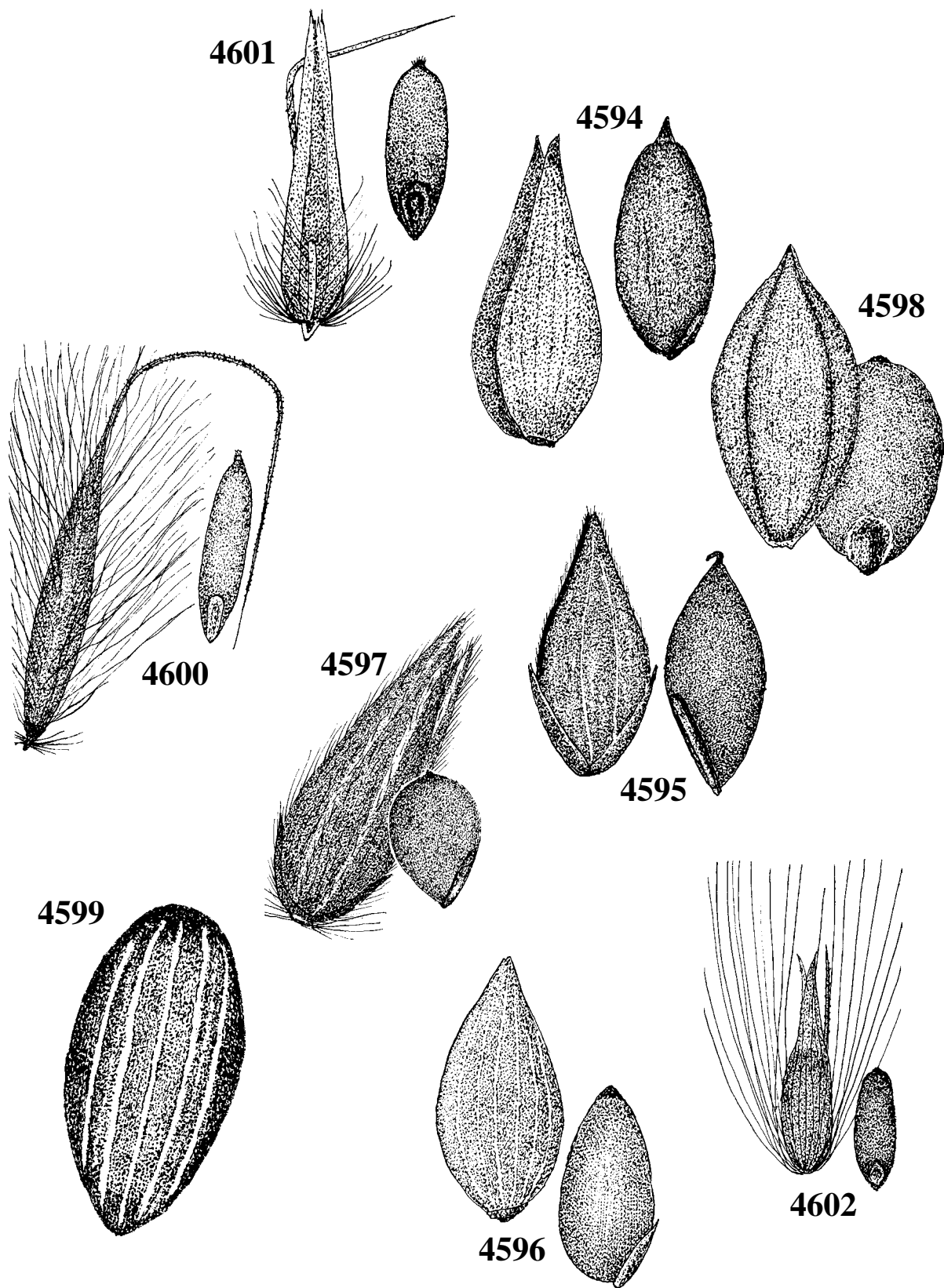
**4599. *Milium vernale*** M. Bieb., *M. confertum* Guss. — Annual, blades erect, 50-100 cm high, scabrous. **Florets obovoid, lemma 5-veinous, awnless, 2.4-2.7 x 1.2-1.4 mm. Surface leathery, bare, strong lustrous, pale-brown. Caryopses connate with lemma. 2n = 8.** Native to Eurasia, stony coasts, shrubberies, forest clearings, sunny lawns. Mo, Ro, Uk.

**4600. *Achnatherum calamagrostis*** (L.) P. Beauv., *Agrostis calamagrostis* L. — Perennial, densely tufted, blades erect, 60-120 cm high, smooth, spurs intrasheath. **Florets oblong-lanceolate (c. 4 mm), patent whitish-hirsute, 3-dentate, awn ± 10 mm long, erect or incurved out, coarse, 4-5.5 x 0.8-0.9 mm. Caryopses oblong, cylindric, planoconvex, ventral side longitudinal furrowed, 2.8-3.2 x 0.5-0.7 mm. Surface longitudinal striate, dull, pale-brown. 2n = 24.** Native to the Mediterranean, sunny coasts, shrubberies, stony soils. Ro.

**4601. *Calamagrostis arundinacea*** (L.) Roth, *Deyeuxia silvatica* (Schrader) Kunth — Perennial, tufted, blades erect, 60-150 cm high, smooth, slightly scabrous only below panicle. **Florets oblong-lanceolate, lemma 5-veinous, 2-dentate, keel with 5-9 mm long kneely crooked awn, apex and bottom long ciliate, 3.8-4.2 x 0.8-0.9 mm. Caryopses ellipsoid, ventral side longitudinal furrowed, 1.8-2.2 x 0.7-0.8 mm. Surface faint striate along, slight lustrous, reddish-brown. 2n = 28.** Native to Euro-Siberia, light leafy and mixed woods, clearings, mountain planes; in all Carpathian regions.

**4602. *Calamagrostis canescens*** (Weber) Roth, *C. lanceolata* Roth — Perennial, slightly tufted, blades erect, 50-150 cm high, thin, with 4-6 nodules, smooth below, scabrous above. **Florets oblong-ovoid, lemma transparent, 5-veinous, 2-dentate, awn short, coarse, hairs of basal wreath longer than the lemma, 2-2.5 x 0.5-0.6 mm. Caryopses oblong-ovoid, planoconvex, furrowed on ventral side, 1.1-1.3 x 0.3-0.4 mm. Surface longitudinal faint striate,**





lustrous, pale-brown.  $2n = 28$ . Native to Euro-Siberia, moister grassy forest clearings, meadows, shrubberies, waters banks. Hu, Mo, Pl, Ro, Sk, Uk.

**4603. *Calamagrostis epigeios* (L.) Roth** – Perennial, tufted, blades stiff, erect, 60-150 cm high, rough, with 2-4 nodules, very scabrous below panicle. Florets prolonged lanceolate, lemma 3-veinous, smooth, translucent, apex 2-dentate, awn grooved, coarse, hairs of basal wreath longer than the lemma, 2.8-3.5 x 0.5-0.6 mm. Caryopses cylindric, planoconvex, ventral side with longitudinal furrow, 2.3-2.8 x 0.4-0.5 mm. Surface longitudinal fine striate, lustrous, brown.  $2n = 28$  (35, 42, 49, 56, 70). Native to Eurasia, forest margins and cut-over areas, shrubberies, sandbanks, shores, silts; throughout the Carpathians.

**4604. *Calamagrostis pseudophragmites* (Haller fil.) Koel., *C. litorea* DC.** – Perennial, tufted, blades erect, rough, 50-150 cm high, smooth, with 2-3 nodules, slightly scabrous panicle below. Florets oblong-cylindric or lanceolate, lemma 3-veinous, semi-hyaline, upper part translucent, awn arising from lemma apex c. 3 mm long, coarse, hairs growing of basal wreath are 2x longer than the lemma, 5-6 x 0.9-1.1 mm. Caryopses ellipsoid, planoconvex, ventral side with longitudinal furrow. 2-2.5 x c. 0.3 mm. Surface faint striate, slight lustrous, brown.  $2n = 28$ . Native to Eurasia, coastal shrubberies, brook deposits. Hu, Mo, Pl, Ro, Sk, Uk.

**4605. *Calamagrostis purpurea* (Trin.) Trin., *C. phragmitoides* Hartm. s. l.** – Perennial, scarcely tufted, blades ramified at base, with 5-8 nodules, 70-200 cm high, smooth, slightly scabrous below panicle. Florets broad lanceolate, lemma 5-veinous, translucent, smooth, 2-dentate above, short awn -awnleted, 2.8-3.4 x 0.5-0.7 mm. Caryopses ellipsoid, planoconvex, furrowed on ventral side, 1.2-1.4 x 0.4-0.5 mm. Surface longitudinal faint striate, dull, dark-brown.  $2n = 56$  (-91). Native to Eurasia, overgrown pond banks. Pl.

**4606. *Calamagrostis stricta* (Timm.) Koeler, *Arundo stricta* Timm, *C. neglecta* (Ehrh.) P. Beauv.** – Perennial, free-tufted, blades stiff, erect, 30-100 cm high, thin, smooth or slightly scabrous above. Florets lanceolate, lemma faint coarse, 5-veinous, 2-dentate, awned from the back half, awn  $\pm$  as long as the lemma, coarse, hairs from basal wreath as long as lemma 2/3-3/4, 2.8-3.2 x 0.7-0.8 mm. Caryopses ellipsoid, planoconvex, 1.3-1.5 x 0.5-0.6 mm.

Surface longitudinal faint striate, slight lustrous, reddish-brown.  $2n = 28$  (56, c. 70). Native to Eurasia, pond banks and moors. Hu, Pl, Ro, Sk, Uk.

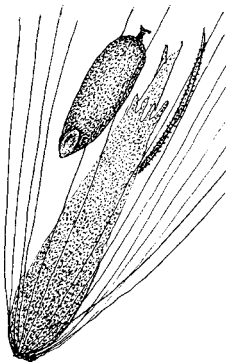
**4607. *Calamagrostis varia* (Schrad.) Host, *C. montana* Host** – Perennial, tufted, blades stiff erect, 30-120 cm high, rough at base, smooth, scabrous only below panicle. Florets (left) lanceolate, lemma 3(-5)-veinous, apex 2-(4)-dentate, lower 1/3 with kneeled awn, a little shorter than the lemma, 3-4 x 0.5-0.6 mm. Caryopses (right) ellipsoid, planoconvex, with longitudinal furrow on lateral side, 1.5-1.7 x 0.45-0.55 mm. Surface longitudinal faint striate, lustreless, pale-brown.  $2n = 28$ . Native to Europe, calcite, stony and grassy slopes, light woods and shrubberies, mountain screes. Hu, Pl, Ro, Sk, Uk.

**4608. *Calamagrostis villosa* (Chaix ex Vill.) J. F. Gmel., *Agrostis villosa* Chaix ex Vill.** – Perennial, laxly caespitose, stems unbranched, ascending, 50-150 cm high, thin smooth, with 4-5 nodules, base with sheaths, thin and reddish. Florets lanceolate, lemma 5-veinous, awn reaching half of floret, coarse, hairs of basal wreath as long as the lemma, 4.5-5 x 0.6-0.7 mm. Caryopses ellipsoid, planoconvex, ventral side with longitudinal furrow, 2.6-3 x 0.5-0.6 mm. Surface longitudinal striate, slight lustrous, pale-brow.  $2n = 28$ . Native to Europe, moist spruce-woods and shrubberies, peat-bogs, mountain planes. Pl, Ro, Sk, Uk.

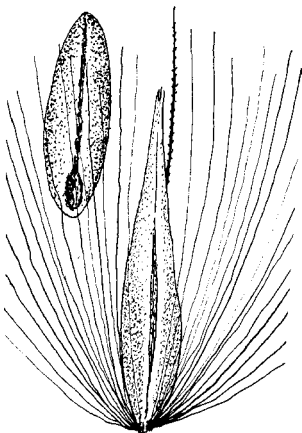
**4609. *Ammocalamagrostis x baltica* (Flügge ex Schrader) P. Fourn.** – Perennial, stems 70-130 cm high, stout, leaves up to 6 mm wide, ribbed on both surfaces, puberulent above. Fruits floret (left), linear-lanceolate 2.5-3 x 0.6-0.8 mm. Caryopsis oblong ellipsoid, concavo-convex, 1.3-1.5 x 0.5-0.6 mm. Surface smooth, slight lustrous, brown.  $2n = 28$ , 42. Hybrid origin (*Ammophila arenaria* x *Calamagrostis epigeios*) isolated in north France and Scotland, on old sand-dunes. Pl.

**4610. *Ammophila arenaria* (L.) Link, *A. australis* (Mabile) Porta, *Arundo arenaria* L.** – Perennial, stems 60-120 cm high, leaves up to c. 5 mm wide, rigid, pungent, strongly ribbed. Florets oblong-lanceolate, lemma and palea acute at apex, awnless, hairs at base, rachilla long haired, 9-13 x 1.5-1.7 mm. Caryopses cylindric, longitudinal furrow on ventral side, hair crest at apex, bottom narrowed with hilum, 4-4.3 x 1-1.2 mm.  $2n = 14$ , 28, 56. Native to coasts of Europe, sand-dunes. Pl, Ro.

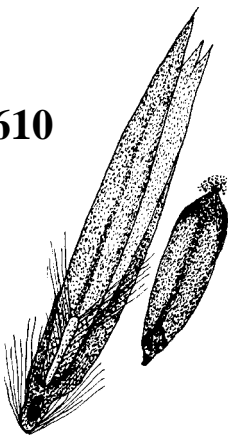
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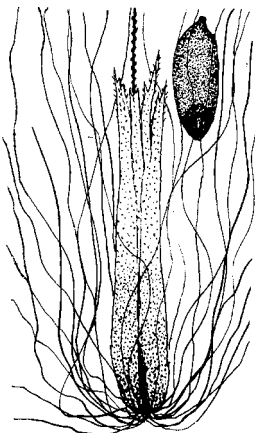
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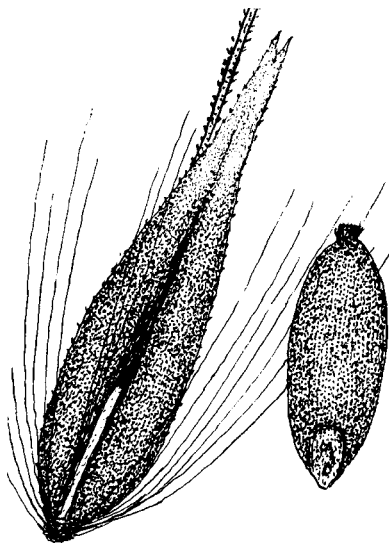
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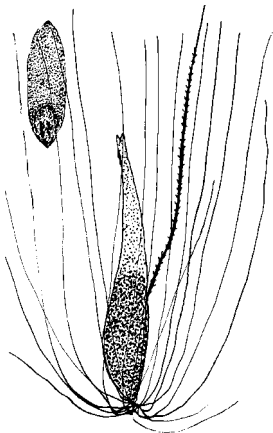
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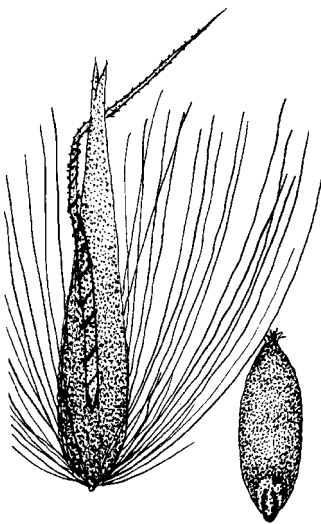
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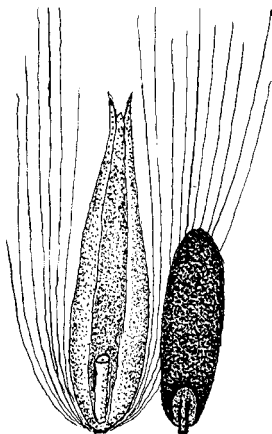
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**4611. *Agrostis alpina*** Scop. — Perennial, tufted, blades 10-30 cm high, ascending, smooth, sheaths of leaves smooth, bottom falling into brown fibres. **Florets lanceolate, lemma 5-veinous, 2-dentate, above keel base with kneeled awn,  $\pm$  5 mm long, basal wreath with short hairs, 1.5-2 x 0.4-0.5 mm. Caryopses ellipsoid, concavo-convex, 1.3-1.5 x 0.3-0.4 mm. Surface longitudinal faint striate, slight lustrous, brown.  $2n = 14$ .** Native to Europe, mountain planes and rocks of the alpine zone. Pl, Ro, Sk, Uk.

**4612. *Agrostis canina*** L. — Perennial, free-tufted, blades numerous, erect, 10-70 cm high, lower nodules rooting down. **Florets spindleshaped, lemma indistinct 3-5-veinous, awn 4-5 mm long (or awnless - *f. mutica* Gaud.), base with short hairs, 1.6-1.9 x 0.4-0.5 mm. Caryopses ellipsoid, concavo-convex, 1.1-1.2 x 0.3-0.4 mm. Surface longitudinal faint striate, slightly lustrous, pale reddish-brown.  $2n = 14$ .** Native to Eurasia, swamp meadows, pastures, pond banks and peatbogs. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4613. *Agrostis capillaris*** L., *A. vulgaris* With., *A. tenuis* Sibth. — Perennial, blades erect or ascending, 10-70 cm high, thin, smooth, crooked. **Florets oblong-ovoid, lemma indistinct 3-5-veinous, blunt, dentate, without or with short awn in the back, 2.2-2.6 x 0.5-0.7 mm. Caryopses ellipsoid, concavo-convex, 1-1.1 x 0.3-0.4 mm. Surface longitudinal faint striate, slight lustrous, reddish-brown.  $2n = 28$ .** Native to Euro-Siberia, meadows, pastures, fallows, peatbogs, light woods and forest edges. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4614. *Agrostis gigantea*** Roth, *A. alba* auct. non L., *A. stolonifera* L. subsp. *gigantea* (Roth) Schuebl. & Martens — Perennial, tufted, blades stout, erect, up to 150 cm high. **Florets lanceolate, lemma bare, semimembranous, awnless, palea  $\pm$  half of the lemma, 1.8-2 x 0.5-0.6 mm. Caryopses ellipsoid, planoconvex, ventral side with furrow, 1.3-1.5 x 0.4-0.5 mm. Surface longitudinal faint striate, lustrous, reddish-brown.  $2n = 42, 46$ .** Native to Eurasia, waste places, lawns, fields and moist meadows. Hu, Mo, Ro, Sk, Uk.

**4615. *Agrostis moldavica*** Dobr. et Beldie, *A. semiverticillata* Dobr. — Perennial, blades ascending, robust, 70-120 cm high, glabrous. **Florets ovoid-lanceolate, margin lemma dense, bottom ciliate, apex acuminate, awnless, 3.4-3.6 x 0.8-1 mm. Surface scarce hirsute, 3-5-veinous. Caryopses**

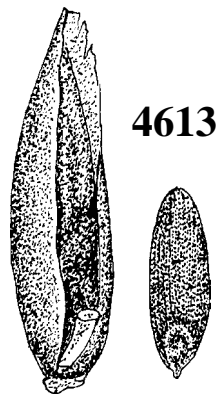
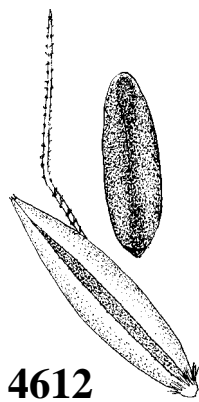
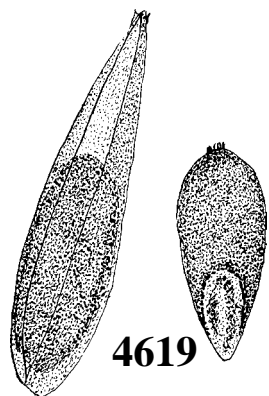
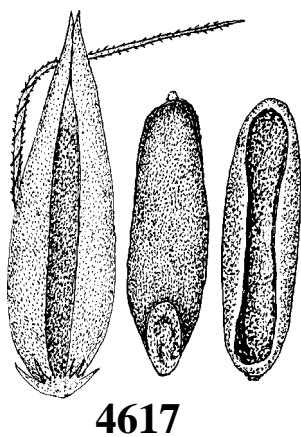
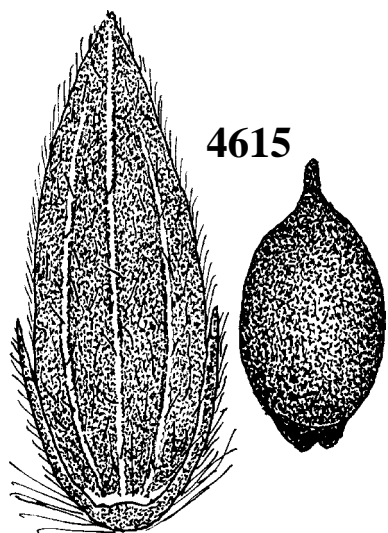
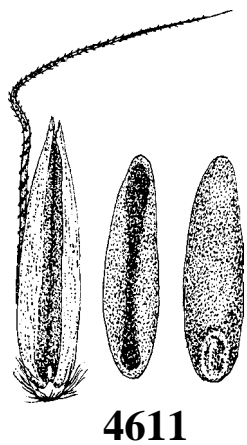
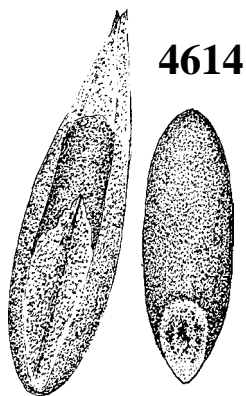
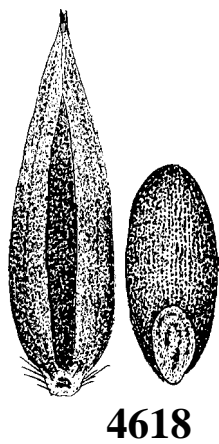
**oval, biconvex, furrowless, apex with beak, bottom with darker hilum, 1.6-1.8 x 0.7-0.8 mm. Surface wrinkly, dull, dark-brown.** Native to Romania, moist places, brooksites, reed (*Phragmites communis*) stands. Ro.

**4616. *Agrostis nebulosa*** Boiss. et Reut. — Annual, blades single, 10-40 cm high, smooth, panicle 5-30 cm long, very scarce. **Caryopses ellipsoid, planoconvex with longitudinal furrow on ventral side, apex with bunch of hairs, bottom gradually narrowed into hilum, 1-1.2 x c. 0.4 mm. Surface longitudinal faint striate, dull, dark-brown.  $2n = 14$ .** Native to the western Mediterranean; in the Carpathians cultivated as ornamental summer plant in gardens, uniquely escaping.

**4617. *Agrostis rupestris*** All. — Perennial, densely tufted, blades stiff, erect, 10-30 cm high, smooth, sheaths of leaves grey to blackish-brown. **Florets lanceolate, lemma membranous, coarse, 2-dentate, lower keel half kneel-awned,  $\pm$  3 mm long, short hairy at base, 1.8-2 x 0.4-0.6 mm. Caryopses ellipsoid, concavo-convex, 1.3-1.5 x 0.4-0.5 mm. Surface longitudinal faint striate, slight lustrous, brown.  $2n = 28$ .** Native to Europe, on stony and grassy mountain ridges and slopes, rocks and screes. Pl, Ro, Sk, Uk.

**4618. *Agrostis stolonifera*** L., *A. palustris* Huds., *A. densissima* (Hack.) Druce — Perennial, blades stiff, erect, 20-150 cm high, smooth, richly branched and procumbent at base, sheaths of leaves narrow, smooth or slightly scabrous. **Florets lanceolate, lemma indistinct 5-veinous, 2-dentate, awnless, apex rare awnleted, hirsute at base, 1.6-1.8 x 0.4-0.5 mm. Caryopses ellipsoid, planoconvex, ventral side furrowed, 0.9-1 x 0.3-0.4 mm. Surface longitudinal faint striate, slight lustrous, reddish-brown.  $2n = 28$ .** Native to Eurasia, moist meadows, pastures, fields, vineyards, boundaries, saline soils. Br, Hu, Mo, Pl, Ro, Sk, Uk.

**4619. *Agrostis tenerrima*** Trin., *A. elegans* Thore ex Loisel. — Annual, blades 10-30 cm high, scabrous, panicle 5-15 cm long, twiglets hairy, thin, scabrous. **Florets lanceolate, lemma bare, dentate at apex, awnless and without rachilla, 1.8-2 x 0.4-0.5 mm. Caryopses obovoid, planoconvex, ventral side with longitudinal furrow, 0.8-1.2 x c. 0.4 mm. Surface longitudinal striate, lustrous, reddish-black.  $2n = 14$ .** Native to the western Mediterranean;



in the Carpathians cultivated as an ornamental in gardens, often transiently escaping.

**4620. *Agrostis vinealis*** Schreb., *A. coarctata* Ehrh. — Perennial, densely tufted, blades erect, smooth. Florets lanceolate, lemma semitransparent, scarce coarse, mostly kneel-awned, 1.6-1.9 x 0.4-0.5 mm. Caryopses broad spindleshaped, concavo-convex, 1-1.3 x 0.3-0.4 mm. Surface longitudinal faint striate, lustrous, reddish-brown.  $2n = 28, 42$ . Native to circumpolar territories, stony pastures, sandy pine-woods, fallows, sunny, stony steppes and grassy slopes, vineyards, forest margins. Ro, Sk, Uk.

**4621. *Apera interrupta*** (L.) P. Beauv. — Annual, blades 20-60 cm high, ascendent up to erect, thin, smooth, sheaths of leaves smooth, often violetish. Florets spindleshaped, lemma upper half short hirsute or coarse, 5-veinous, short ciliate at base, apex thin and smooth, awn 5-15 mm long, 1.8-2.2 x 0.4-0.5 mm. Caryopses spindleshaped, planoconvex, ventral side with furrow, 1.3-1.5 x c. 0.4 mm. Surface lustreless, whitish-yellow.  $2n = 14$ . Native to Eurasia, on sandbanks, light sandy pine-woods. Hu, Ro, Sk, Uk.

**4622. *Apera spica-venti*** (L.) P. Beauv. — Annual, blades 30-120 cm high, erect, stout, smooth, sheaths of leaves smooth or scabrous above, often violetish. Florets oblong-lanceolate, lemma upper half short hirsute, short ciliate at base, 5-veinous, awn 6-13 mm long, apex thin, glabrous, 2.2-2.6 x 0.5-0.6 mm. Caryopses oblong-ellipsoid, planoconvex, ventral side with longitudinal furrow, 1.3-1.5 x c. 0.4 mm. Surface smooth, lustreless, albescent.  $2n = 14$ . Native to Euro-Siberia, dry, sandy fields, sandy shores and waste places; in all Carpathian territories.

**4623. *Lagurus ovatus*** L. — Annual, dense greyish downy, blades 10-40 cm high, erect or ascendent, simple or ramified at base, sheaths of upper leaves inflated. Florets spindleshaped, lemma 5-veinous, ciliate at base, kneeled and coarse awn up to 20 mm, apex with 2-bristles, 3.8-4.2 x 0.9-1 mm. Surface coarse and scarce hirsute. Caryopses ellipsoid, biconvex, 2.4-2.8 x 0.7-0.8 mm. Surface longitudinal faint striate, lustrous, yellowish-brown.  $2n = 14$ . Native to the Mediterranean; in the Carpathians sometimes cultivated as ornamental summer plant in gardens and rarely escaping, or hauling with wool.

**4624. *Polypogon monspeliensis*** (L.) Desf. — Annual, tufted, blades numerous, erect or ascendent, 10-70 cm high, bare, smooth, sheaths of leaves slightly scabrous. Florets in hirsute lemma, with 5-7 mm long awns, palea membranous, transparent, 4-dentate, 2.5-3 x 1.2-1.7 mm. Caryopses broad spindleshaped, biconvex, ventral side with furrow, 1.4-1.6 x 0.6-0.8 mm. Surface longitudinal striate, lustrous, reddish-brown.  $2n = 28$ . Native to the Mediterranean and western Europe; rarely hauling into the Carpathians. Ro.

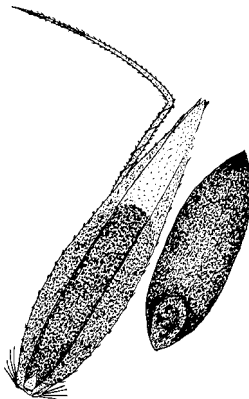
**4625. *Gastridium ventricosum*** (Gouan) Schinz et Thell., *G. lendigerum* (L.) Gaud. — Annual, bunchly branched at base, blades erect, or shortly ascendent, up to 40 cm high, smooth. Florets lemma coarse, with erect awns (left), palea membranous, small, hirsute apex with 5 mm long and thin awnlet (middle), 2.8-3.6 x 1.2-1.6 mm. Caryopses (right) obovoid, biconvex, lateral side with longitudinal furrow, 0.8-0.9 x 0.4-0.5 mm. Surface longitudinal faint striate and pitted, lustrous, pale-brown.  $2n = 14$ . Native to southern Europe; rarely hauling into the Carpathians, sandy places, sunny coasts, shrubberies of the lowland zone. Ro.

**4626. *Alopecurus aequalis*** Sobol., *A. fulvus* Sm. — Annual to biennial, blades numerous, procumbent or geniculately ascendent, central blades erect. Florets ellipsoid, lemma on keel and margins ciliate, rest of surface coarse or sparse hirsute, back half with short (0.5-2 mm) awn, 2-2.5 x 1.1-1.4 mm. Caryopses  $\pm$  ellipsoid, lateral compressed, 1.2-1.4 x 0.6-0.7 mm. Surface longitudinal faint striate, slight lustrous, yellowish.  $2n = 14$ . Native to circumpolar territories, denuded riverbanks, flooded fields, boundaries, meadow moors; throughout the Carpathians.

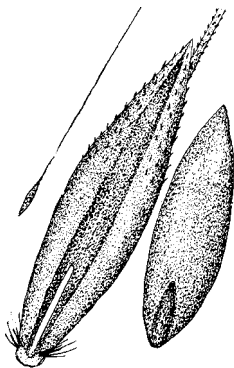
**4627. *Alopecurus geniculatus*** L. — Annual to biennial, blades numerous, procumbent or nodular ascendent, 15-50 cm high, rooting down at base and nodules. Florets ellipsoid, lemma hirsute, ciliate at keels, apex truncate or laciniate with geniculate 3-4 mm long awn under back half, 2.4-3 x 1.2-1.6 mm. Caryopses short or longer ellipsoid, lateral compressed, often with rest of the style at apex, 1-1.5 x 0.8-0.9 mm. Surface longitudinal faint striate, slight lustrous, pale or dark-greyish.  $2n = 28$ . Native to boreal Europe, wet meadows and roads, boundaries, riverbanks; in all Carpathian territories.



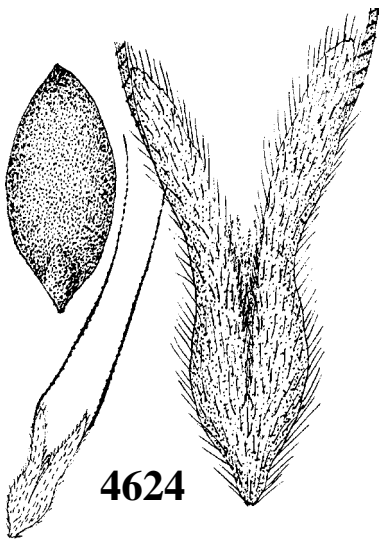
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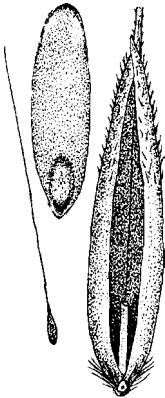
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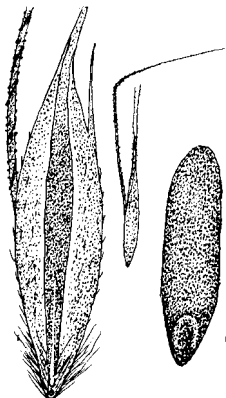
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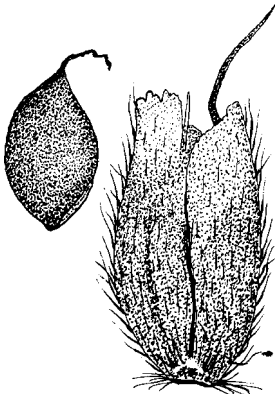
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**4628. *Alopecurus myosuroides*** Huds., *A. agrestis* L. — Annual to biennial, tufted, blades erect, 20-60 cm high, rarely procumbent or ascendent,  $\pm$  scabrous. Florets oblong-obovoid, lemma acuminate, veins ciliate, awn c. 8 mm long, 5.5-6 x 1.8-2 mm. Surface coarse, geniculate from back side. Caryopses obovoid, biconvex, without furrow on ventral side, 2.8-3 x 0.8-1 mm. Surface longitudinal faint striate, lustreless, pale-brown.  $2n = 14$ . Native to the Mediterranean; occasionally hauling into the Carpathians as a field weed.

**4629. *Alopecurus pratensis*** L. — Perennial, tuftless, blades erect or shortly ascendent, 30-100 cm high, smooth, nodules rooting down at base, leafy sheaths narrow, smooth. Florets broad spindle-shaped, lemma acuminate, hirsute and ciliate, 3-veinous, lower back 1/4 with geniculate, 6-9 mm long awn, 4.8-5.5 x 1.4-1.6 mm. Caryopses obovoid, planoconvex, ventral side with broad, longitudinal furrow, 2.4-2.8 x 1.2-1.4 mm. Surface longitudinal faint striate, slight lustrous, pale-brown.  $2n = 28$ . Native to Euro-Siberia, moist meadows, pastures, brookbanks, waste places; in all Carpathian territories.

**4630. *Alopecurus ventricosus*** Pers., *A. arundinaceus* Poir. — Perennial, blades up to 150 cm high, erect, c. 4 mm in diam. Florets ellipsoid, lemma with evident divergent peaklets, straw whitish or nigrescent, dense ciliate at margins, awnless, 4-4.5 x 1.3-1.7 mm. Caryopses  $\pm$  obovoid, lateral compressed, apex with beak, bottom gradually narrowed, 2.1-2.5 x 0.8-1 mm. Surface longitudinal faint striate, lustreless, pale- or dark-grey.  $2n = 28$ . Native to Eurasia, marshy places. Mo, Pl, Ro, Uk.

**4631. *Phleum hirsutum*** Honck., *M. michelii* All. — Perennial, tufted, blades erect, 20-90 cm high, smooth, violetish, sheaths bare, smooth. Florets lanceolate, lemma bare or scarce downy, apex acuminate, bare, awnless, 1.8-2.3 x 0.5-0.7 mm. Caryopses ellipsoid, biconvex, longitudinal furrow indistinct, 1.1-1.2 x 0.4-0.5 mm. Surface smooth, slight lustrous, yellowish.  $2n = 14$ . Native to Europe (Alps and Carpathians), mountain ridges and rocks, reinforced scree, plains and shrubberies on calcite grounds. Pl, Ro, Sk, Uk.

**4632. *Phleum hubbardii*** D. Kováts, *P. bulbosum* Host non Gouan — Perennial, scarcely tufted, blades 10-50 cm high, erect, with 5-10 nodules. Florets cylindric, lemma (left) coarse, ciliate at keels and margins, awns 0.5-1 mm long, 3.5-4 x 1.3-1.4 mm.

Surface straw whitish, lusterless. Palea (right down) semimembranous, 1.9-2.1 x 1-1.2 mm. Surface coarse, distinct venous, whitish. Caryopses (right up) oval, lateral compressed, 1.7-1.9 x 0.9-1 mm. Surface dull, brown.  $2n = 14$ . Native to Europe, dry meadows and pastures, semisteppe, stony or shrubby slopes, road banks. Sk.

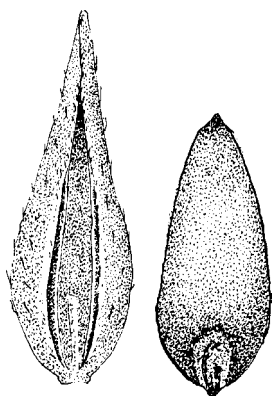
**4633. *Phleum montanum*** K. Koch, *Ph. ambiguum* Borbás — Perennial, densely tufted, up to 70 cm high, erect, feeble. Florets lanceolate, lemma (left) on veins hirsute up to ciliate, 2 short lemma peaks coarse. Palea (right) bare, acuminate, apex long and bare, 2.4-2.6 x 0.5-0.6 mm. Caryopses (above) ellipsoid, planoconvex, longitudinal furrow indistinct, 1.2-1.3 x 0.4-0.5 mm. Surface longitudinal faint striate, lustrous, yellowish-brown.  $2n = 14, 28, 42$ . Native to Eurasia, lawns, weedy places, sunny  $\pm$  dry, calcareous stands of upland and montane zones. Ro, Uk.

**4634. *Phleum paniculatum*** Huds., *P. asperum* Jacq. — Annual, tufted, blades erect, 10-50 cm high, sometimes ascendent, smooth, branched at base, sheaths smooth or slightly scabrous. Florets oblanceolate, lemma coarse and scarce hirsute, swollen and awnleted in upper part, 2.5-3 x 1.5-1.7 mm. Caryopses ovoid, planoconvex, longitudinal furrow indistinct, 1.2-1.4 x 0.5-0.7 mm. Surface longitudinal faint striate, lustrous, yellowish-brown.  $2n = 28$ . Native to the Mediterranean and Front Asia; rarely hauling into the Carpathians, waste places, rubbish heaps, sunny, sandy and dry places. Hu, Mo, Ro, Uk.

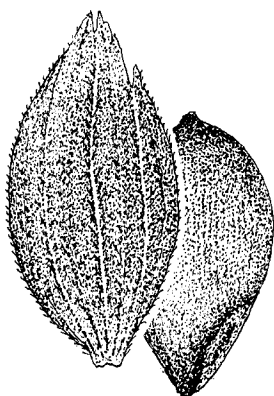
**4635. *Phleum phleoides*** (L.) H. Karst., *P. boehmeri* Wibel — Perennial, tufted, blades stiff, erect, 10-80 cm high, with 2-3 nodules, leafless above, often purplish. Florets lanceolate, lemma coarse, scarce hirsute, 3-veinous, awnless, rachilla thin and smooth, 1.4-1.6 x 0.5-0.6 mm. Caryopses oblong-ovoid, planoconvex, longitudinal furrow distinct, 1-1.1 x 0.4-0.5 mm. Surface smooth or faint longitudinal striate, lustrous, yellowish.  $2n = 14$ . Native to Eurasia, dry sunny slopes and downs, steppes and semisteppes, meadows; in all Carpathian territories.

**4636. *Phleum pratense*** L. — Perennial, scarcely or densely tufted, blades erect or shortly ascendent, 20-150 cm high, with 2-6 nodules, at base unstout. Florets oval, lemma short downy, awnless, 1.7-2.2 x 0.7-0.9 mm. Surface whitish, slight lustrous. Caryopses obovoid, lateral compressed, apex with

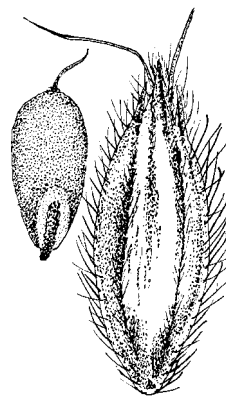




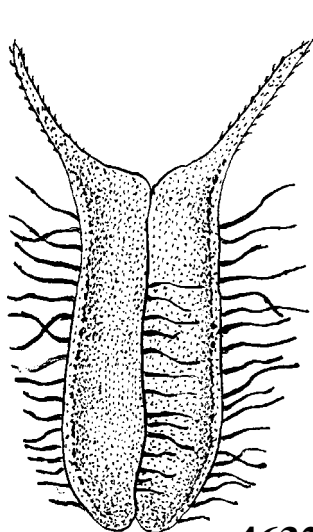
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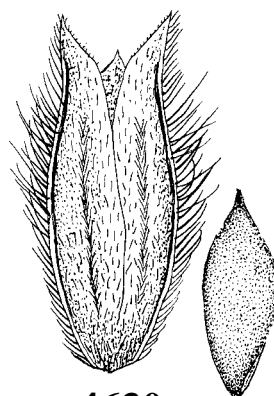
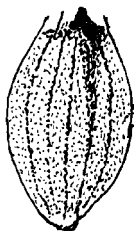
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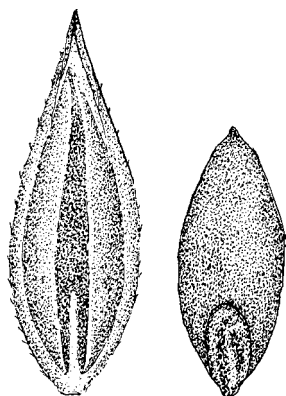
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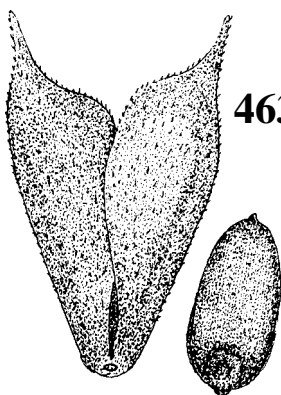
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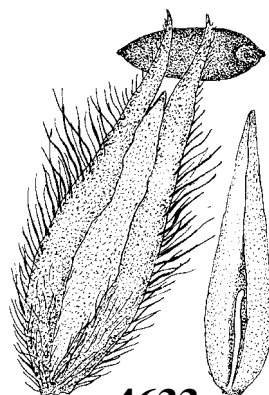
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small beak, bottom gradually narrowed, 1.4-1.6 x 0.6-0.7 mm. Surface longitudinal faint striate, dull, brown.  $2n = 42$ . Native to Eurasia, meadows, moist pastures, park lawns, boundaries; throughout the Carpathians, often sowed in meadows and lawns.

**4637. *Phleum rhaeticum*** (Humphries) Rauschert, *P. pratense* subsp. *alpinum* auct. non (L.) Čelak. — Perennial, densely tufted, blades erect, 10-50 cm high, with 2-4 nodules. Florets obovoid, lemma 3-5-veinous, downy on veins, ciliate on keel, awns coarse, as long as the lemma, 4.5-5.5 x 2-2.2 mm. Caryopses ellipsoid, lateral compressed, apex with small beak, bottom on ventral side with hilum, 1.6-1.8 x 0.6-0.7 mm. Surface wrinkly, dull, brown.  $2n = 14$ . Native to circumpolar territories, mountain meadows, ridges, planes, especially near sheep-farm. Pl, Ro, Sk, Uk.

**4638. *Phleum subulatum*** (Savi) Aschers. et Graebn., *P. tenue* (Host) Schrad. — Annual, tufted, blades erect, 10-40 cm high, with 1-6 nodules, leafy sheaths smooth. Florets obovoid, palea 9-veinous, apex truncate or lacinate, 1.1-1.2 x 0.6-0.7 mm. Surface slight wrinkly, faint lustrous, whitish. Caryopses obovoid, lateral flattish, 0.9-1 x 0.5-0.6 mm. Surface longitudinal faint striate, slight lustrous, dark reddish-brown.  $2n = 14$ . Native to southern Europe, fields, fallows, forest margins, lawns, stony places, sunny and dry places. Hu, Ro, Uk.

**4639. *Mibora minima*** (L.) Desv., *Calamagrostis minima* (L.) Borkh. — Annual, blades tufted filiform, 2-15 cm high. Florets ellipsoid, lemma dense covered with strong and undulated whitish hairs, awnless, 1.5-1.7 x 0.6-0.7 mm. Caryopses ellipsoid, biconvex, longitudinal furrow indistinct, 0.9-1 x 0.4-0.6 mm. Surface longitudinal faint striate, slight lustrous, brown.  $2n = 14$ . Native to southern and western Europe; rarely hauling into the Carpathian sandy grounds.

**4640. *Eragrostis cilianensis*** (All.) F. T. Hubb., *E. major* Host, *E. megastachya* (Koeler) Link — Annual, stems up to 60 cm high, erect or decumbent at base, smooth or sparsely hairy, panicle up to 15 cm long, dense. Florets broadly ovate, apex acute, often glandular on the keel, awnless, 2.9-3.3 x 0.8-1 mm. Caryopses ellipsoid, waved wrinkly on dorsal and ventral sides, 1.1-1.3 x 0.7-0.8 mm. Surface slight lustrous, dark-purplish.  $2n = 20$ . Native to southern Europe, rocky places and disturbed grounds; casual

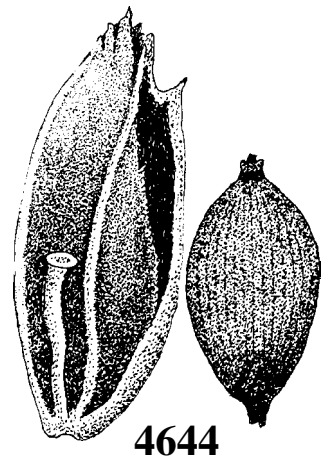
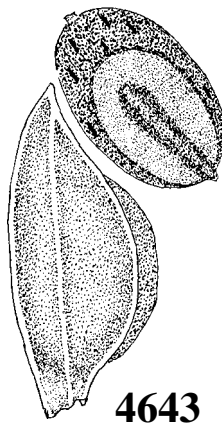
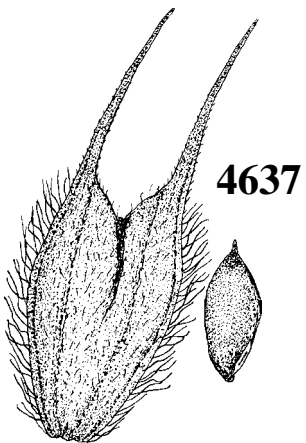
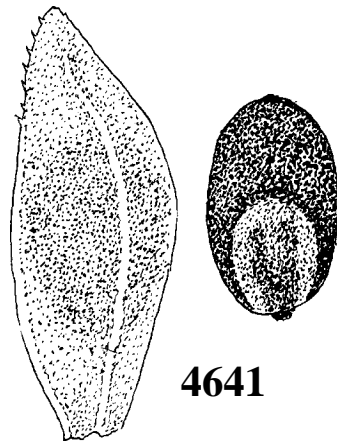
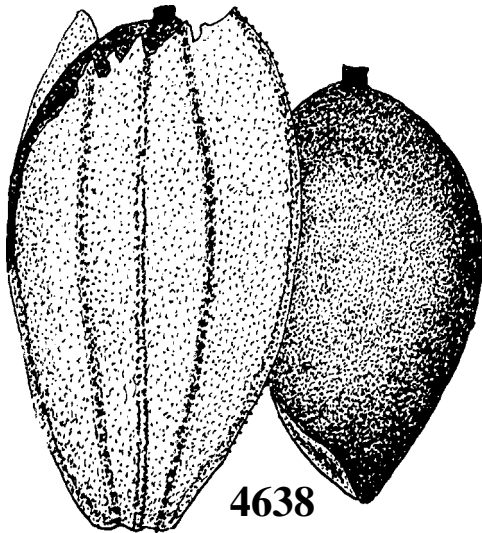
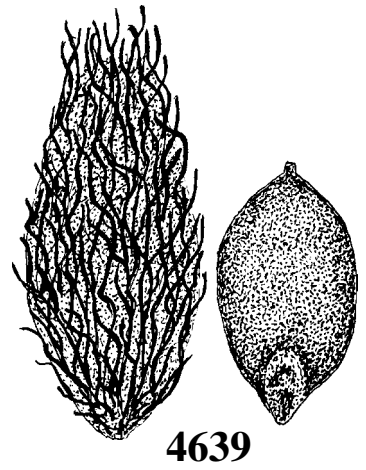
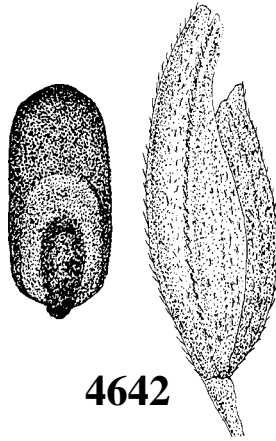
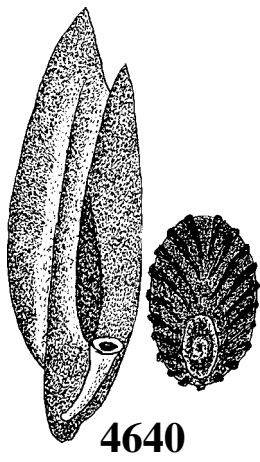
and locally naturalized in the South Carpathians. Hu, Ro, Sk.

**4641. *Eragrostis minor*** Host, *E. suaveolens* Becker ex Claus — Annual, tufted, blades erect or ascendent, 10-50 cm high, smooth, exceptionally sparsely hirsute. Florets  $\pm$  lanceolate, lemma acuminate with one pair of lateral veins, awnless, 1.2-1.5 x 0.5-0.6 mm. Surface glabrous, slight lustrous, grayish. Caryopses oval, roundish in transversal section, longitudinal furrow indistinct, bottom with large hilum, 0.6-0.7 x 0.4-0.5 mm. Surface dull, reddish-brown.  $2n = 40$ . Native to Eurasia, sandy fields, fallows, roads, embankments, village surroundings, walls; in all Carpathian regions.

**4642. *Eragrostis pilosa*** (L.) P. Beauv., *Poa pilosa* L. — Annual, tufted, blades numerous, erect or ascendent, 5-50 cm high, bare, smooth, leaf sheaths geniculately ciliate. Florets oblong-ovoidal, lemma coarse, hirsute on keel, indistinct veins, awnless, 2-2.5 x 0.6-0.8 mm. Surface scarce hirsute. Caryopses ellipsoid, biconvex, longitudinal furrow indistinct, hilum large, 1.1-1.3 x 0.6-0.7 mm. Surface longitudinal striate, slight lustrous, reddish-brown.  $2n = 40$ . Native to Eurasia, stony slopes, river deposits, fallows, roads, pastures, saline soils. Br, Hu, Mo, Ro, Sk, Uk.

**4643. *Eragrostis tef*** (Zucc.) Trotter, *E. abyssinica* (Jacq.) Link. — Annual, stems 40-100 cm high, leaves broad (up to 5 cm wide). Florets ovoid, apex acute, lemma strong scabrous on keel, awnless, 1.7-2 x 0.8-0.9 mm. Caryopses ellipsoid, with large hilum on ventral side, 1-1.3 x 0.7-0.8 mm. Surface smooth or faint wrinkly, faint lustrous, yellowish-brown with indistinct, longitudinal, small, reddish-brown spots. Native to Ethiopia; for its caryopses cultivated to a small extent in warmer part of the Carpathians.

**4644. *Catabrosa aquatica*** (L.) P. Beauv., *Aira aquatica* L. — Perennial, blades geniculately ascendent, 20-90 cm high, glabrous. Florets ovoid, lemma slight coarse, brown, 5-veinous, apex lacinated, awnless, rachilla long, glabrous, 2.2-2.5 x 0.9-1.1 mm. Caryopses ellipsoid, biconvex, longitudinal furrow indistinct, apex with small beak, 1.4-1.6 x 0.7-0.8 mm. Surface longitudinal striate, lustreless, dark-brown.  $2n = 20$ . Native to Eurasia, northern Africa and North America, swampy and muddy places, stagnant or slowly flowing waters in



lowland and upland zones; current in all Carpathian regions.

**4645. *Molinia arundinacea*** Schrank — Perennial, blades up to 250 cm high, panicle  $\pm$  spreading, ovoid-pyramidal in outline. **Florets (left) lanceolate, lemma long acuminate or truncate, awnless, rachilla apex and surface smooth, 4.8-5.5 x 1.2-1.4 mm. Caryopses (right) ellipsoid, planoconvex, ventral side with longitudinal furrow, 2.4-2.8 x 0.9-1.1 mm. Surface longitudinal striate, dull, dark-brown to black.  $2n = 36$ .** Native to Europe, water banks, moist meadows, moist forest edges, acid, poor soils, Hu, Pl, Ro, Sk.

**4646. *Molinia caerulea* (L.) Moench, *M. raria*** Schrank — Perennial, blades 30-90 cm high, stiff, erect, with one roundish node, basal article 5 cm high, roughened, sheaths smooth, hirsute above. **Florets oblong-ovoid, apex acuminate, awnless, rachilla hirsute, 4.1-4.6 x 1-1.2 mm. Surface smooth, greenish-violet. Caryopses ellipsoid, planoconvex, longitudinal furrow indistinct, 2-2.4 x 0.9-1.1 mm. Surface longitudinal faint striate, slight lustrous, brown to black.  $2n = 36$ .** Native to Europe, moist meadows, peatbogs, swamps, leafy woods; throughout the Carpathians.

**4647. *Molinia litoralis*** Host, *M. caerulea* subsp. *littoralis* (Host.) Paul — Perennial, stems 30-150 cm high, erect, rigid, glabrous, nodulous at base, panicle twigs patent to erecto-patent. **Florets prolonged ovoid, lemma awnless, palea shorter than the lemma, 4.7-5.3 x 1-1.2 mm. Caryopses ovoid or ellipsoid, concavo-convex, apex with crest or growth, with large hilum, 2.3-2.7 x 0.9-1.1 mm. Surface fine cornate, lustreless, brown or blackish-brown.** Native to Eurasia and northern Africa, lawns, wood clearings, wet places, moorlands, saline stands. Pl, Ro, Uk.

**4648. *Cleistogenes serotina* (L.) Keng, *Diplachne serotina* (L.) Link** — Perennial, densely tufted, blades ascendent or erect, 30-100 cm high, stiff, smooth, or slightly scabrous above. **Florets lanceolate, lemma indistinct veinous, scarce hirsute, apex awned, rachilla apex hirsute, 4.8-5.3 x 1-1.2 mm. Caryopses lanceolate, biconvex, without longitudinal furrow, hilum large, 3-5 x 0.9-1.1 mm. Surface glabrous, hyaline, lustrous, yellowish.  $2n = 40$ .** Native to Eurasia, sunny, stony and shrubby slopes, mostly calcareous grounds. Hu, Mo, Ro, Sk, Uk.

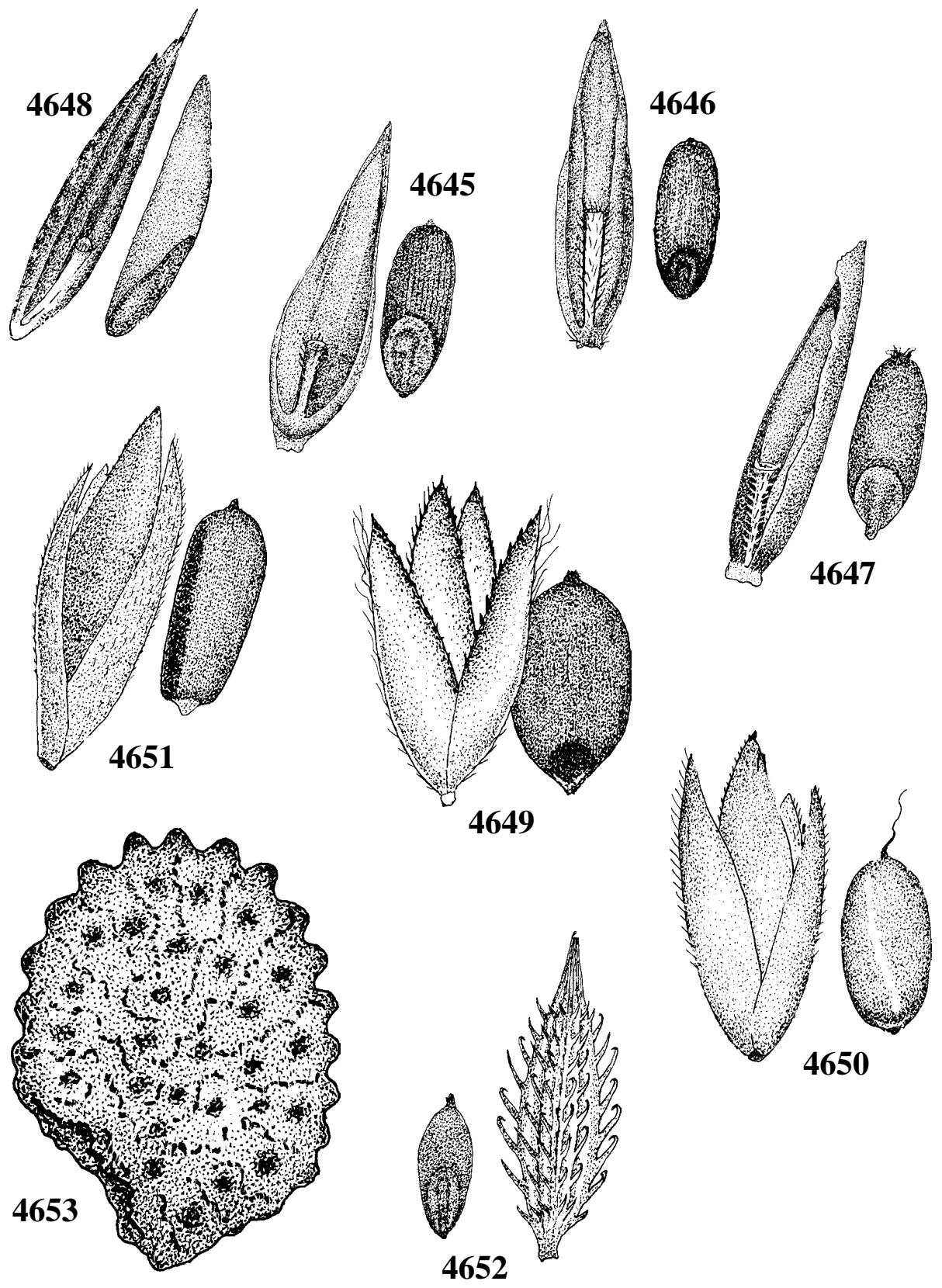
**4649. *Heleochloa alopecuroides* (Piller et Mitterp.)** Host, *Crypsis alopecuroides* (Piller et Mitterp.) Schrad. — Annual, blades up to 30 cm high, numerous, ascendent. **Florets lanceolate, glumes and lemma ciliate on keel, lemma longer than the glumes, awnless, 1.8-2.2 x 1-1.2 mm. Surface bare, whitish, greyish at margins. Caryopses oval, compressed from dorsal and ventral sides, longitudinal furrow indistinct, 1.3-1.5 x 0.7-0.8 mm. Surface longitudinal faint striate, dull, dark-brown.  $2n = 18$ .** Native to denuded banks of ponds, saline grounds, flooded areas., Br, Hu, Mo, Ro, Sk.

**4650. *Heleochloa schoenoides* (L.) Host ex Roem., *Crypsis schoenoides* (L.) Lam.** — Annual, blades compressed, up to 30 cm high, with lateral flowering spurs, upper sheath inflated. **Florets  $\pm$  obovoid, glumes on keel hirsute, lemma whitish, membranous, smooth, awnless, 2.5-3 x 1.1-1.3 mm. Caryopses ellipsoid, dorsal and ventral sides compressed and convex, longitudinal furrow, hilum indistinct, 1.3-1.4 x 0.6-0.7 mm. Surface striate, slight lustrous, pale-brown with pale belt leading from apex to bottom.  $2n = 36$ .** Native to Eurasia, saline grounds, denuded pond banks, ditches, boundaries. Hu, Mo, Ro, Sk, Uk.

**4651. *Crypsis aculeata* (L.) Aiton, *Heleochloa diandra*** Host — Annual, tufted, blades numerous, procumbent, apex ascendent, 5-40 cm long, ramified,  $\pm$  flattish, striate on one side. **Florets  $\pm$  obovoid, glumes on keel hirsute, lemma acuminate, awnless, 3.2-3.8 x 1-1.2 mm. Surface lustrous, bare. Caryopses cylindric, lateral flat, 1.8-2 x 0.6-0.8 mm. Surface longitudinal faint striate, lustreless, dorsal side pinkish, ventral dark-brown.  $2n = 18$ .** Native to Eurasia, saline soils, overflowing and denuded stream banks. Hu, Mo, Ro, Sk, Uk.

**4652. *Tragus racemosus* (L.) All., *Cenchrus racemosus* L.** — Annual, tufted blades procumbent or ascendent, 10-40 cm high, richly branched below, smooth, reddish. **Florets lanceolate, lemma acuminate, dorsal side spined in 6 rows, ventral side 3-veinous, 4-5 x 2-2.6 mm. Caryopses ellipsoid, biconvex, without longitudinal furrow, with large hilum, 1.5-2 x 0.6-0.8 mm. Surface slight lustrous, brown.  $2n = 40$ .** Native to Eurasia, roads, rubbish heaps, fallows, waste places. Hu, Mo, Ro, Sk, Uk.

**4653. *Dactyloctenium aegyptium* (L.) Willd., *Cynosurus aegyptius* L.** — Annual, tufted, blades shortly ascendent, 20-50 cm high, ramified at base, leafy



sheaths smooth, bare. **Caryopses of various shapes, mostly  $\pm$  spherical, lateral compressed, distinct humpy, 0.9-1.1 x 0.7-0.9 mm. Surface slight lustrous, pale reddish-brown.  $2n = 36$  (20, 34, 40).** Native to the subtropical areas of the Old World; rarely hauling into the Carpathians.

**4654. *Cynodon dactylon* (L.) Pers.** — Perennial, blades ascendent, 10-40 cm high, slender, smooth, sheaths smooth, bare. **Florets lanceolate, lemma boat-shaped, indistinct 3-veinous, hirsute at margins and keel, awnless, 2.3-2.7 x 1-1.2 mm. Caryopses ellipsoid or obovoid, lateral compressed, 1.1-1.3 x 0.6-0.8 mm. Surface longitudinal faint striate, lustreless, greyish-brown.  $2n =$  (36) 40.** Native to circumpolar territories, dry, warmed up, nutrition-rich, sandy and loamy soils. Hu, Mo, Ro, Sk, Uk.

**4655. *Chloris barbata* Sw.** — Annual, blades up to 100 cm high, arcuate ascending, often rooting at base. **Florets  $\pm$  obovoid, lemma bare, hirsute on keel and at margin and longly ciliate from there, awns 2-3x as long as the floret, 2.5-2.7 x 0.8-1 mm. Surface straw whitish. Caryopses oblong-obovoid, lateral slightly compressed, hilum large, 1.8-2 x 0.5-0.6 mm. Surface glabrous, lustrous, yellowish, hilum brown.** Native to the tropical belt; in the Carpathians rarely cultivated as an ornamental plant.

**4656. *Chloris radiata* (L.) Schwartz, *Agrostis radiata* L.** — Annual, stems up to 50 cm high, flattish, glabrous, leaves coarse. **Florets spindleshaped, awn up to 2-3x as long as the floret, apex slight hirsute, bottom ciliate, 2.5-3 x c. 0.5 mm. Caryopses fusiform, lateral compressed, with oblong hilum, 1.7-1.9 x c. 0.4 mm. Surface smooth, slight lustrous, dark-brown.** Native to tropic America; uniquely hauling, mostly with the wool into the Carpathians.

**4657. *Chloris truncata* R. Br.** — Annual, blades nodulose and rooting down, sheaths smooth. **Florets  $\pm$  obovoid, lemmas on apex truncate, smooth, awns longer than the lemmas, coarse, 3.5-3.7 x 1.7-1.9 mm. All surface blackish. Caryopses prolonged ellipsoid, planoconvex, 2-2.3 x c. 0.5 mm. Surface glabrous, lustrous, yellowish, hilum brownish.** Native to the tropical Old and New World; rarely dragging with raw wool into the Carpathians.

**4658. *Nardus stricta* L.** — Perennial, densely and strongly tufted, tufts erect, numerous and heaped up

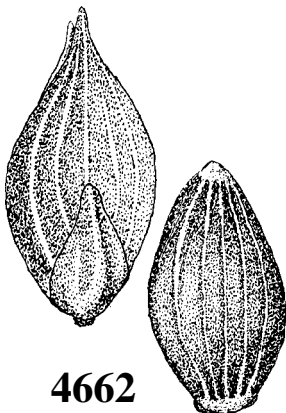
in rows, blades stiff erect, 10-40 cm high, leafed only at base, smooth, scabrous above. **Florets oblong-laciniate, lemma 3-veinous, short hirsute, with coarse, erect, c. 3 mm long awn at apex, 10-12 x 0.6-0.8 mm. Caryopses linear lanceolate, lower half concavo-convex, 5-7 x 0.5-0.6 mm. Surface scabrous, lustreless, pinkish.  $2n = 36$ .** Native to Europe, pastures, poor meadows, peatbogs, heathery places, light woods, mountain ridges. Br, Hu, Pl, Ro, Sk, Uk.

**4659. *Phragmites australis* (Cav.) Trin., *Arundo australis* Cav., *A. phragmites* L.** — Perennial, stems 80-400 cm high, not overwintering, usually simple, panicle 10-50 cm long, gradually tapering to a long, slender apex. **Florets prolonged ovoid, lemma narrow lanceolate, acute to acuminate, rachides with abundant long hairs, 3.5-4.5 x 2.1-2.5 mm. Caryopses very rare or absent.  $2n = 36, 48$ .** Native to the northern circumpolar territories, riverbanks, marshes, peatbogs, wet fields and meadows, lowland woods; in all Carpathian regions.

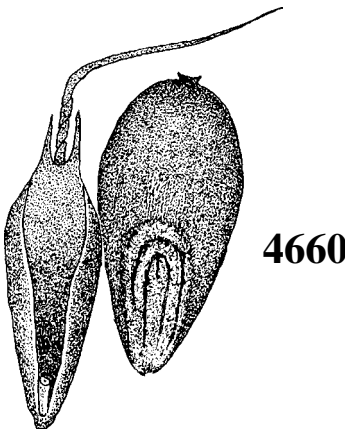
**4660. *Danthonia alpina* Vest., *D. provincialis* DC., *D. calycina* (Vill.) Rchb.** — Perennial, tufted, blades erect or ascending, 30-70 cm high. **Florets oblong-ellipsoid, lemma 7-9-veinous, ciliate at margins, with up to 1 cm long, geniculate awn, 7-8 x 2.2-2.4 mm. Caryopses oblong-obovoid, planoconvex, from bottom up to 2/3 with longitudinal furrow, 3.4-3.6 x 1.5-1.7 mm. Surface glabrous, lustrous, reddish-brown.  $2n = 36$ .** Native to Europe, pastures, forest meadows and clearings, shrubberies, upland and montane zones. Hu, Ro, Sk, Uk.

**4661. *Danthonia decumbens* (L.) DC., *Sieglindia decumbens* (L.) Bernh.** — Perennial, densely tufted, blades erect, stiff, 10-60 cm high, smooth, sheaths, glabrous, ciliate on border. **Florets (left) obovoid, lemma 7-9-veinous, with 2 bunches of hairs and 2 short teeth at base, notch with short awnlet, 4.8-5.8 x 1.8-2.1 mm. Caryopses (right) oval, planoconvex with indistinct longitudinal furrow, apex hairy, bottom with large hilum, 2.1-2.5 x 1.2-1.4 mm. Surface slight wrinkly, lustrous, reddish-brown.  $2n = 36$ .** Native to Europe, semisteppes, meadows and pastures, heath-clad slopes, fallows and sandbanks. Br, Hu, Pl, Ro, Sk, Uk.

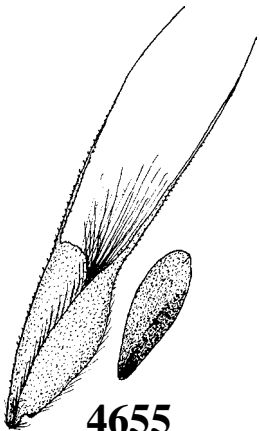
**4662. *Panicum capillare* L.** — Annual, blades erect or ascendent, 10-80 cm high, sheaths coarsely hirsute.



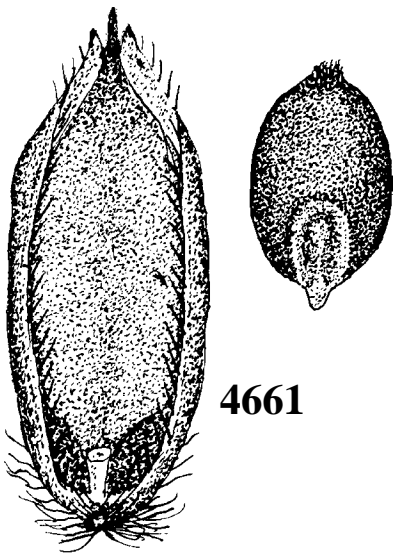
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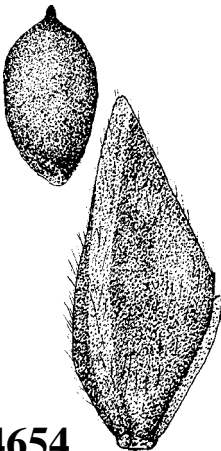
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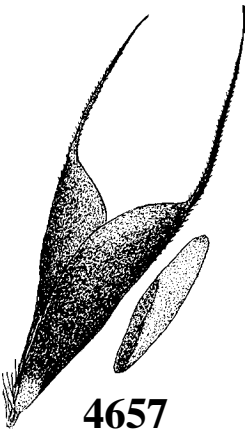
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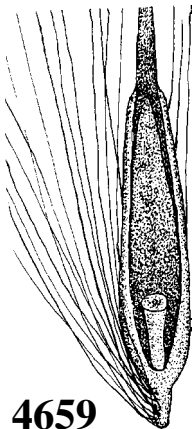
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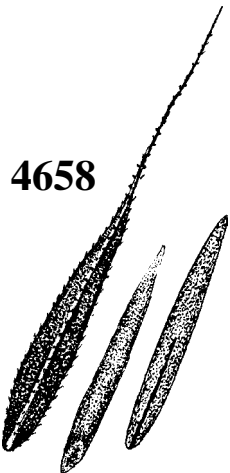
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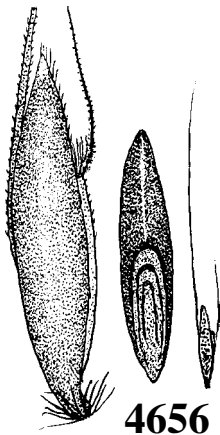
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Florets broad lanceolate, lemma 5-veinous, acuminate, awnless, 1.7-2.1 x 0.8-1 mm. Caryopses ovoid or  $\pm$  ellipsoid, biconvex, without longitudinal furrow, apex and bottom blunt rounded, 1.2-1.6 x 0.7-0.9 mm. Surface 5-veinous, glabrous, high lustrous, greyish-brown.  $2n = 18$ . Native to North America; in the Carpathians sometimes cultivated as an ornamental summer plant in gardens, uniquely escaping into waste places.

**4663. *Panicum miliaceum* L.** — Annual, tufted, blades stiff, erect, sometimes shortly ascending, 50-120 cm high, coarsely hirsute at base, glabrous above, sheaths hirsute. Florets  $\pm$  spherical or slight ellipsoid, lemma indistinct or 5-7-veinous, apex blunt acuminate, bottom blunt rounded, 2.8-3.2 x 1.9-2.1 mm. Surface glabrous, high lustrous, grey, orange or yellow. Caryopses spherical, bottom narrowed into navel, 2-2.4 x 1.8-2 mm. Surface smooth, dull, whitish.  $2n = 36$ . Native to eastern Asia, since the prehistoric times cultivated in warmer areas of the Carpathians as an important cereal.

**4664. *Panicum repens* L., *P. leiogonum* Del.** — Perennial, blades arising from the nodules of a creeping rhizome, spikelets green. Florets broad lanceolate, lemma 3-veinous, awnless, 2.4-2.7 x 1-1.2 mm. Surface lustreless, straw-white. Caryopses ellipsoid, biconvex, ventral side without longitudinal furrow, 1.8-2 x 0.7-0.9 mm. Surface glabrous, strong lustrous, whitish. Native to the Mediterranean, ditches, moist sandy places, also as a weed in fields and gardens; rarely hauling into warmer areas of the Carpathians.

**4665. *Echinochloa colonum* (L.) Link** — Annual, free-tufted, blades 10-70 cm high, thin, ascendent. Florets ovoid-ellipsoid, lemma 3-7-veinous, coarse or hirsute on veins, awnless, 2.5-2.9 x 1.4-1.6 mm. Surface straw- or violetish-coloured. Caryopses broad ellipsoid, planoconvex, without longitudinal furrow, dorsal side with 3-indistinct veins, 2.1-2.5 x 1.2-1.4 mm. Surface glabrous, high lustrous, pale-yellowish.  $2n = 36, 48, 54, 72$ . Native to the Mediterranean; rarely hauling into Carpathian waste places and dumps.

**4666. *Echinochloa crus-galli* (L.) Beauv., *Panicum crus-galli* L.** — Annual, free-tufted, blades erect or rarely ascendent, 30-100 cm high, bare, glabrous, nodules hirsute, sheaths smooth. Florets ovoid-ellipsoid, lemma with 5 slight hirsute veins, embraced only by ventral side of the grain, awn

as long as the floret, 2.3-2.7 x 1.7-1.9 mm. Caryopses ellipsoid, planoconvex without longitudinal furrow, 1.3-1.7 x 1.2-1.4 mm. Surface glabrous, high lustrous, grey.  $2n = 54$ . Native to circum-polar territories, as a weed in fields, gardens, fallows, roadsides, river and brookbanks, sandbanks; in all Carpathian territories.

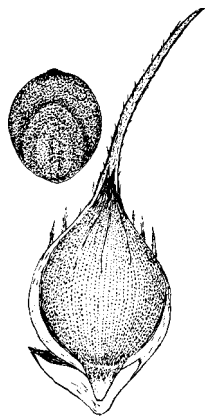
**4667. *Echinochloa frumentacea* Link, *Panicum frumentaceum* Roxb.** — Annual, stems 50-120 cm high. Florets ovoid, lemma 5-veinous, on veins sparse ciliate, awn as long as the lemma or shorter, 3.1-3.5 x 1.8-2 mm. Surface dark straw-coloured. Caryopses ellipsoid, inflated, 2.5-2.7 x 1.5-1.7 mm. Surface smooth, lustrous, greenish or greyish-white. Native to eastern Asia; experimentally cultivated as fodder and cereals in the southern Ukraine, occasionally naturalized there. Uk.

**4668. *Echinochloa oryzoides* (Ard.) Fritsch, *E. coarctata* (Steven) Kossenko, *E. macrocarpa* Vasinger** — Annual, blades erect, 25-160 cm high, panicle 6-25 cm. Florets broad ovoid, lemma 5-veinous, veins coarse or sparse hirsute, with bare (c. 1 cm long) awn, 3.8-4.2 x 2.2-2.5 mm. Caryopses planoconvex, without longitudinal furrow on ventral side, dorsal side with 3 veins, apex acuminate, 2.2-2.5 x 1.9-2.1 mm. Surface glabrous, high lustrous, grey.  $2n = 36$ . Native to southern Europe; mostly hauling as a weed into Carpathian rice fields, in warmer areas. Hu, Mo, Ro, Sk, Uk.

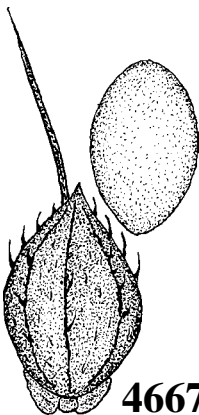
**4669. *Eriochloa villosa* (Thunb.) Kunth** — Annual to biennial, stems 30-60 cm high, panicle c. 10 cm long, spikelets with one flower and pedicels having dense, long hairs. Florets ovoid, glumes similar, 3-veinous + marginal veins, 4.8-5.2 x 2.3-2.5 mm. Caryopses ovoid, embraced with lemma and palea, 4-4.4 x 2.1-2.3 mm. Surface of lemma smooth, palea transversal fine wrinkly, faint lustrous, light-green. Native to eastern Asia, a weed in rice fields of the southern Ukraine. Uk.

**4670. *Digitaria ischaemum* (Schreb. ex Schweigg.) Mühlenb., *D. humifusa* Pers.** — Annual, blades procumbent or nodulous ascendent, ramified, 10-40 cm high, sheaths bare. Florets short ellipsoid, lemma 3-5-veinous, margins and veins downy, awnless, 1.9-2.3 x 0.9-1.2 mm. Surface dull, violetish coloured. Caryopses ovoid-lanceolate, planoconvex, without longitudinal furrow, 1.8-2.1 x 0.8-0.9 mm. Surface longitudinal faint striate, slight lustrous, dark-violet.  $2n =$

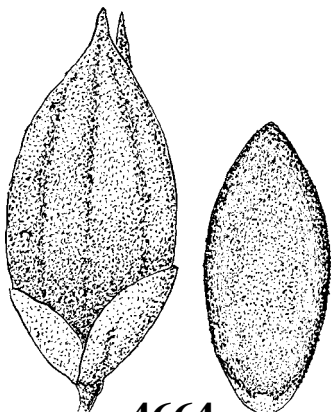




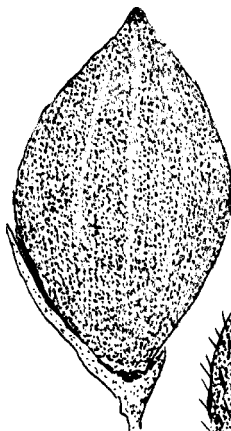
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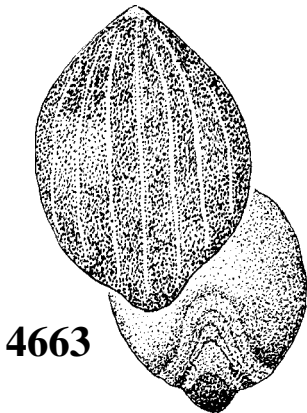
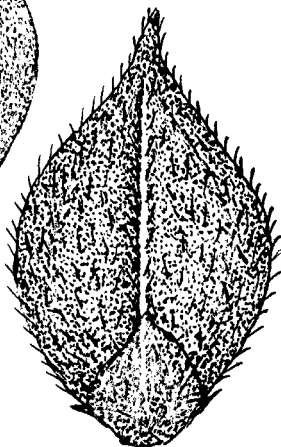
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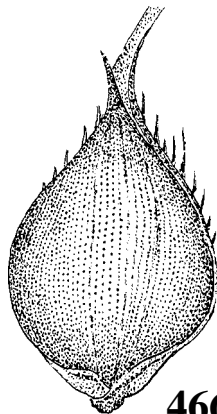
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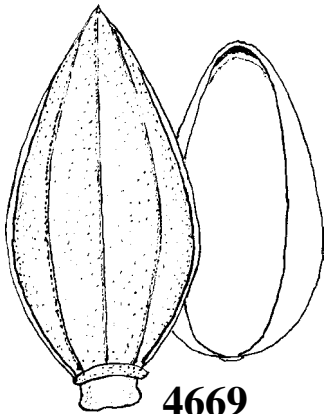
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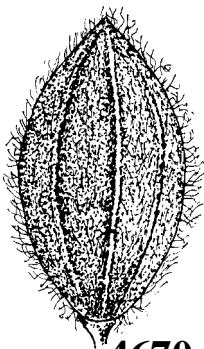
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**36.** Native to circumpolar territories, fallows, fields, gardens, moist, sandy and loamy soils in warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**4671. *Digitaria pectiniformis*** (Henrard) Tzvelev, *D. ciliaris* auct. non (Retz.) Koeler — Annual, blades procumbent or geniculately ascendent, ramified at base, up to 30 cm high. **Florets broad lanceolate, 3-veinous, dense ciliate at margins, awnless, 2.5-2.9 x 0.8-1 mm. Caryopses blunt ellipsoid, planoconvex, without longitudinal furrow, 1.8-2 x 0.7-0.8 mm. Surface glabrous, slight lustrous, hyaline-yellowish, hilum pale-brown. 2n = 36.** Native to warm and temperate zones of both hemispheres, tilled lands and fallows, rare. Hu, Mo, Ro, Sk, Uk.

**4672. *Digitaria sanguinalis*** (L.) Scop., *Panicum sanguinale* L. — Annual, tufted, blades nodular ascendent, 20-60 cm high, on base rooting down, glabrous, bare, sheaths inflated. **Florets broad lanceolate, lemma acuminate, on veins coarse up to hirsute, awnless, 2.9-3.2 x 1-1.2 mm. Caryopses ellipsoid, planoconvex, without distinct longitudinal furrow, 1.8-2 x 0.8-1 mm. Surface faint wrinkly, lustreless, pale greyish-green. 2n = 36.** Native to southern Europe, often hauling into Carpathian fallows, fields, vineyards, gardens and waste places, cultivated as a cereal in the past. Hu, Mo, Pl, Ro, Sk, Uk.

**4673. *Setaria faberi*** F. Hermann — Annual, tufted, blades erect, 40-200 cm high, also on nodules bare. **Florets ellipsoid, lemma fine transversal wrinkly, 2.6-2.8 x 1.1-1.5 mm. Surface lustreless, pale-green. Caryopses oval, planoconvex, on bottom of ventral side with rusty spot, 1.6-1.8 x 1.1-1.3 mm. Surface glabrous, slight lustrous, green. 2n = 36.** Native to eastern Asia; rarely and transiently hauling into Carpathian railway stations, dumps and ports.

**4674. *Setaria italica*** (L.) P. Beauv., *Panicum italicum* L. — Annual, stout, blades single, erect, 100-150 cm, glabrous, sheaths bare or scarcely hirsute. **Florets broad ellipsoid, lemma on dorsal side convex, apex blunt acuminate, ventral side ± flat, orange or yellowish coloured, 2.4-2.8 x 1.5-1.7 mm. Caryopses compressed, dorsal side convex, ventral side ± flat, apex roundish, on bottom with oblong hilum, 1.9-2.1 x 1.5-1.6 mm. 2n = 18.** Origin unknown, perhaps mutant from *S. viridis*. Once often (from Bronze Age) cultivated as forage and bird-seed; in warmer areas of all Carpathians.

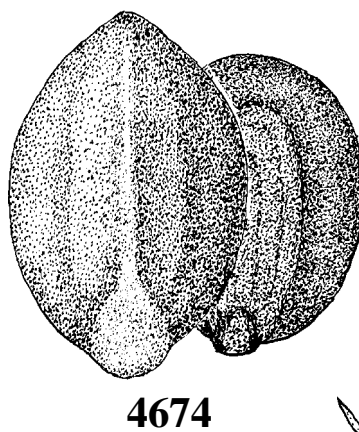
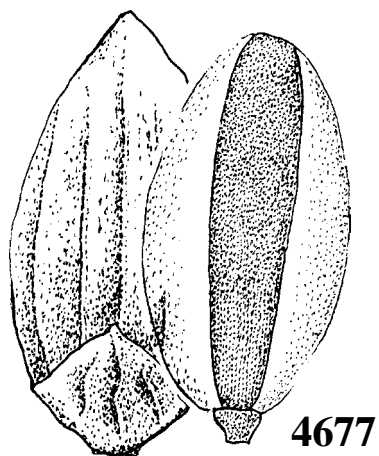
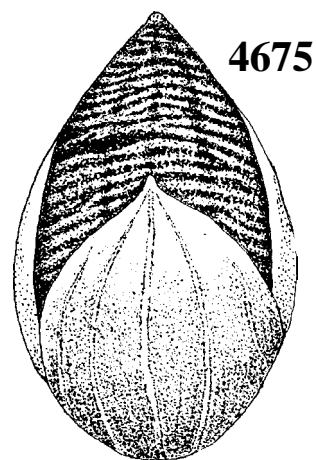
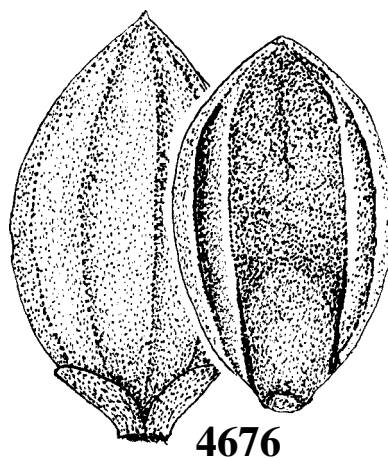
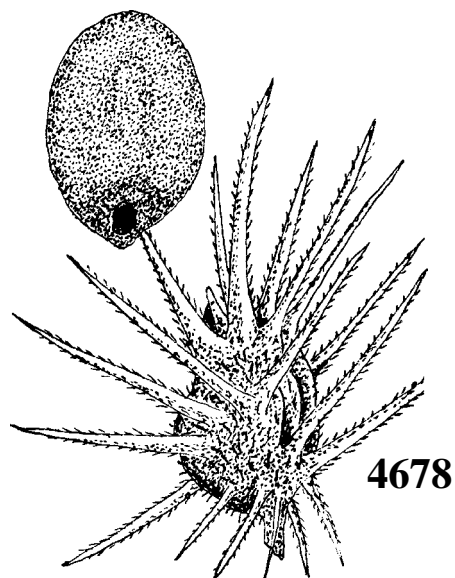
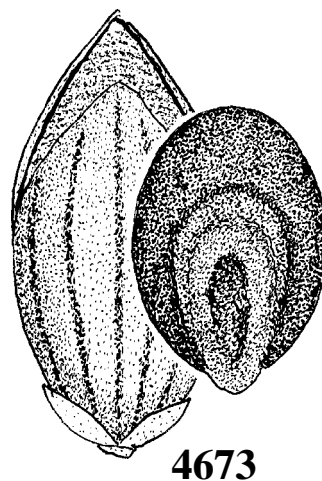
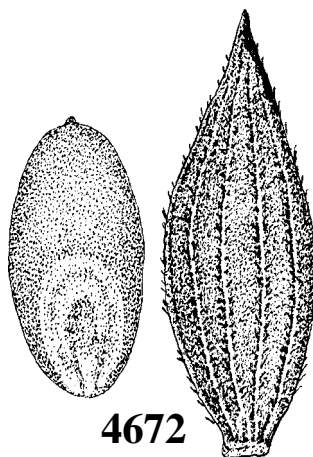
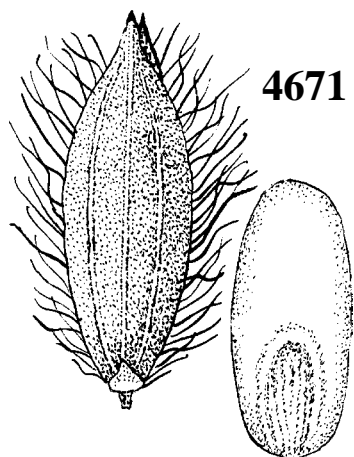
**4675. *Setaria pumila*** (Poir.) Roem. et Schult., *S. glauca* (L.) P. Beauv. (p. p.) — Annual, blades procumbent or nodulous ascendent, 5-100 cm high, sometimes branched below, glabrous, scabrous beneath panicle. **Florets broad ovoid, lemma shorter than the caryopsis, 5-veinous, acuminate, 3-3.4 x 1.8-2.2 mm. Surface straw-coloured. Caryopses ovoid, transversal wrinkly, planoconvex, 2.1-2.4 x 1.5-1.7 mm. Surface without longitudinal furrow. 2n = 36.** Native to Eurasia, fields, fallows, vineyards, waste places, roadsides; throughout the Carpathians.

**4676. *Setaria verticillata*** (L.) P. Beauv., *S. panicea* (L.) Schinz et Thell. — Annual, blades single, erect or ascendent, 20-100 cm high, glabrous below, scabrous above, sheaths smooth or slightly scabrous. **Florets broad ellipsoid, lemma 3-veinous, awnless, 2.2-2.5 x 1.2-1.4 mm. Surface faint wrinkly, greenish, pale or dark-brown. Caryopses ovoid, planoconvex, 2.1-2.3 x 1.1-1.3 mm. Surface faint wrinkly, lustrous, greenish. 2n = (18), 36 (54).** Native to Eurasia, fallows, fields, rubbish heaps, gardens, vineyards; in all Carpathian territories.

**4677. *Setaria viridis*** (L.) P. Beauv., *Panicum viride* L. — Annual, tufted, blades procumbent up to ascending, 10-100 cm high, glabrous below, scabrous above, sheaths bare, smooth. **Florets ellipsoid, awnless, 2.2-2.5 x 1.2-1.4 mm. Surface of lemma longitudinal wrinkly, lustrous, dark-brown. Caryopses ellipsoid, planoconvex, hilum large, brown, 2-2.2 x 0.9-1.1 mm. Surface glabrous, lustrous, greyish-green. 2n = 18.** Native to circumpolar territories, fields, rubbish heaps, roadsides, vineyards; throughout the Carpathian regions.

**4678. *Cenchrus echinatus*** L. — Annual, tufted, blades 20-60 cm high, erect, leafy, sheaths inflated. **Florets in bristly hirsute cover, with garland of longer and shorter hirsute bristles at base, 5-8 x 5-6 mm. Caryopses ellipsoid, planoconvex, 2.7-3.1 x 1.8-2 mm. Surface smooth, semihyaline, slight lustrous or dull, yellowish-white. 2n = 34, 68.** Originally growing in North America; rarely hauling into Carpathian rubbish heaps and dumps.

**4679. *Cenchrus incertus*** M. A. Curt., *C. pauciflorus* Benth., *C. tribuloides* auct. non L. — Annual, blades procumbent, up to 40 cm high, scabrous above, rooting down at nodules, ascendent. **Florets spinely double-caryopsis, spine 2-4 mm long, corpus and**



base of spines downy, 8-9 x 10-12 mm. Caryopses ellipsoid, planoconvex, hilum on dorsal side, bottom black, 3.2-3.6 x 2.9-3.1 mm. Surface smooth, dull, brown.  $2n = 34, 36$ . Originally spread from North America; rarely hauling into Carpathian waste places and vineyards. Hu, Ro, Uk.

**4680. *Sorghum bicolor* (L.) Moench, *S. vulgare* Pers., *S. nigrum* (Arg.) Roem. et Schult.** – Annual, 2-4 m high, panicle prolonged, ovoidal, dense. Florets ellipsoid, lemma 2-dentate, acuminate, awn geniculate, 2x longer than the floret, rachillas ciliate, 5.5-6.5 x 2.5-3 mm. Surface glabrous margins hirsute. Caryopses  $\pm$  ovoid, biconvex, lateral compressed, hilum large, 4-4.4 x 2.3-2.7 mm. Surface smooth, lustreless, brown.  $2n = 20$ . Native to Africa; in the Carpathians in certain areas cultivated for green fodder in warmer lowland zone.

**4681. *Sorghum bicolor* var. *saccharatum* (L.) Moehlenb.** – Annual, blades erect, 2-4 m high, glabrous, simple or ramified beneath, sheaths smooth. Florets ellipsoid, lemma on apex and stalk hirsute, rest of surface glabrous, lustrous, reddish-brown or violetish, 5.5-6.5 x 3-3.6 mm. Caryopses  $\pm$  spherical, compressed, bottom of ventral side with black spot, dorsal side with large hilum, apex with rest of the style, 3.8-4.2 x 2.8-3.2 mm.  $2n = 20$ . Native to tropical Africa; cultivated as green fodder in certain areas of the Carpathians.

**4682. *Sorghum bicolor* var. *technicum* (Körn.) Stapf.** ex Holland – Annual, blades erect, simple or ramified from beneath. Florets ellipsoid, lemma below and at margins dense hirsute, rest of the surface glabrous, lustrous, reddish-brown, 5-5.6 x 3.2-3.5 mm. Caryopses obovoid, planoconvex, compressed, bottom of ventral side with dark-brown spot, large hilum, 4.1-4.7 x 2.8-3.2 mm. Surface glabrous, dull, rusty-brown.  $2n = 20$ . Native to tropical Africa; cultivated for brush industry in certain areas of the Carpathians.

**4683. *Sorghum halepense* (L.) Pers., *Holcus halepensis* L.** – Perennial, blades numerous, tufted, erect, 50-150 cm high, 3-10 mm in diam., smooth, sheaths glabrous. Florets ellipsoid, lemma on apex 2-dentate, apex acuminate, awned, rachillas ciliate, 5-6 x 1.8-2.2 mm. Surface smooth, hirsute on veins, geniculate. Caryopses broad obovate, planoconvex, with indistinct furrow on ventral side, large hilum, 2.5-2.8 x 1.5-1.7 mm. Surface smooth, dull, blackish-brown.  $2n = 40$ . Native to

the Mediterranean; in the Carpathians occasionally cultivated for fodder in warmer areas. Hu, Mo, Ro, Sk, Uk.

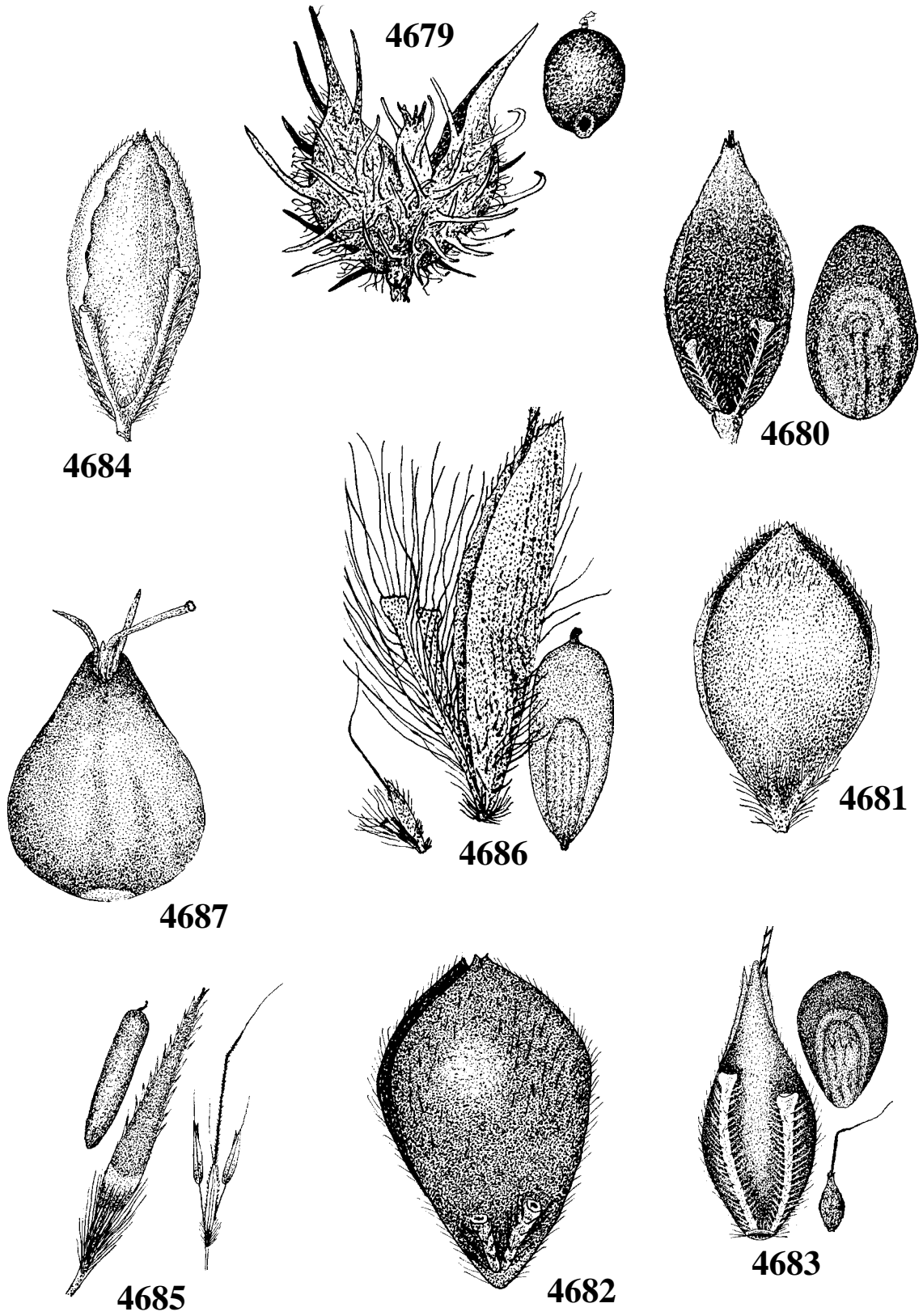
**4684. *Sorghum sudanense* (Piper) Stapf, *Andropogon sudanensis* Piper** – Annual, blades 150-300 cm high, panicle 15-30 cm long, ovoid or pyramidal in outline, sparse. Florets oblong-ellipsoid, lemma glabrous, sparse hirsute, apex 2-dentate, awnless, rachillas ciliate, 5.5-6.5 x 2.4-2.8 mm. Caryopses obovoid, lateral compressed, hilum large, 3.8-4.2 x 2-2.3 mm. Surface glabrous or slight wrinkly, reddish-brown.  $2n = 20$ . Native to Africa; in the Carpathians rarely cultivated for fodder in warmer areas. Hu, Mo, Sk, Uk.

**4685. *Chrysopogon gryllus* (L.) Trin., *Andropogon gryllus* L.** – Perennial, densely tufted, blades 50-100 cm high, erect, pubescent. Florets prolonged lanceolate, lemma oblong acuminate, 2-dentate, ciliate on bottom, hirsute above, awn geniculate, 2-4 mm long, 8-11 x 0.9-1.1 mm. Caryopses long and narrow, biconvex, 4-4.5 x 0.8-1 mm. Surface longitudinal faint striate, slight lustrous.  $2n = 40$ . Native to Eurasia, sunny, stony semisteppe hills, sandbanks. Hu, Mo, Ro, Sk, Uk.

**4686. *Bothriochloa ischaemum* (L.) Keng, *Andropogon ischaemum* L.** – Perennial, free-tufted, blades numerous, 20-80 cm high, nodulous ascendent, glabrous, sheaths smooth. Florets prolonged semiellipsoid, upper margins of lemma hirsute, with geniculate 15-20 mm long awn, two large long haired rachillas, 4-4.5 x 0.9-1.1 mm. Caryopses oblong-obovate, apex with rest of the style, bottom with large germ hilum, 2-2.5 x 0.8-1 mm. Surface smooth, lustreless, greyish-yellow.  $2n = 40$ . Native to Eurasia, sunny dry slopes, pastures, fallows, sandbanks of warmer areas. Hu, Mo, Pl, Ro, Sk, Uk.

**4687. *Coix lacryma-jobi* L.** – Annual, blades up to 2 m high, erect, glabrous, bare, panicle sparse, free. Caryopses, covered with rough, hard and porcelaneous lustrous sheath of support leaflet, broad ovoid or pyriform, apex hole with rest of stigma, 9-11 x 7-8 mm. Surface glabrous, high lustrous, pale- or dark-greyish. Plant of tropical origin (Africa and Asia); in the Carpathians rarely cultivated as ornamental in gardens.

**4688. *Zea mays* L.** – Annual, stout, blades 150-250 cm high, 2-6 cm in diam., erect, leafy, rooting down at lower nodules, sheaths of the leaves



smooth, inflorescence declinuous, monogamous. A plant of Central American origin grown since ancient times, now cultivated worldwide as cereal or green fodder in warmer areas, in many convarieties, varieties and cultivars.  $2n = 80, 40, 80$ . Each convar. has its own biological and ecological qualities. The classification is mostly based on the endosperm characteristics as follows:

**4688a. *Zea mays* L. convar. *mays*** – hornlike marginal part of white, thin, starchy endosperm caryopses is equably decomposed in the space, in the inter-space there are proteins and colloidal hydrocarbons. **Caryopses broad obovoid, lateral compressed, apex  $\pm$  truncate, bottom narrowed into hilum, 9-11 x 8-10 mm. Surface smooth, slight lustrous, upper part yellowish, bottom lustreless, whitish.** Cultivated in many cvs for fodder, starch and spirit manufacturing industry.

**4688b. *Zea mays* L. convar. *mays* var. *tunicata* St. Hill.** – Caryopses of this maize are enclosed into lemma, like in tunics, 16-20 x 8-10 mm. Caryopses sector-shaped, dorsal side convex, ventral conical, upper part spherical shaped with small beak on apex, narrowed into hilum, 8-10 x 6-8 mm. Surface glabrous, dorsal side slight lustrous, yellowish, ventral side whitish, lustreless, wrinkly. Native to Central America; rarely cultivated in maize breeding institutes and stations.

**4688c. *Zea mays* L. convar. *amylacea* (Sturt.) Greb.** – with very thin pericarp and a large amount of white starchy endosperms. **Caryopses transversal ellipsoid, dorsal side semispherical, glabrous, lateral slight compressed, slight lustrous or lustreless, yellow, ventral side rooflike, strong, flat-tish and narrowed into hilum, 6.5-7.5 x 8-10 mm. Surface dull, whitish.** One of the oldest forms created in America by the Inca civilization, now cultivated worldwide as a cereal and green fodder.

**4688d. *Zea mays* L. convar. *ceratina* Kulešov** – Caryopses of this maize irregular quadratic, lateral slight flattish, hilum large and whitish, endosperm in circumference has qualities and characteristics of wax, 8.5-9.5 x 8-9 mm. Surface smooth, hard, mighty, faint lustrous, yellow. Cultivated in Asia.

**4688e. *Zea mays* L. convar. *dentiformis* Körn.** – in this case the corneous layer is at the sides and the

starchy layer protrudes to the crown with only a small layer of pericarp. **Caryopses  $\pm$  obovoid or obconic, lateral compressed, dorsal side broad,  $\pm$  truncate, ventral side gradually narrowed, top area distinct depressed, 10-12 x 7-8.5 mm. Surface glabrous, slight lustrous or lustreless, mostly yellow, pinkish at bottom.** Economically the most important fodder crop species.

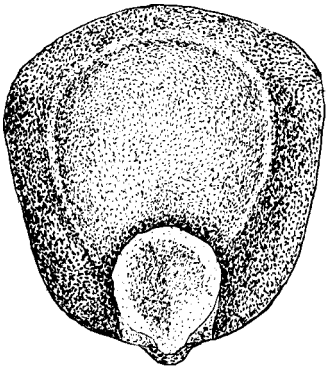
**4688f. *Zea mays* L. convar. *indurata* Sturt. or *vulgaris* Körn.** – this convar. has small starchy endosperm, with a very thick, corneous, starchy layer and higher contents (up to 14 %) of proteins. **Caryopses broad obovoid, lateral compressed, dorsal side roundish, ventral gradually narrowed, 9-11 x 8-10 mm. Surface glabrous, lustrous, reddish to dark-red, hilum pale.** The best cvs for human consumption.

**4688g. *Zea mays* L. convar. *microsperma* Körn. or *everta* Sturt.** – has hard corneous pericarp and relatively large amount of starchy endosperms, it also has the smallest caryopses of all convar. **Caryopses obovoid, slight lateral compressed, dorsal side rounded and broadest, ventral narrowed and thinner, 6.5-7.5 x 3.5-4.5 mm, or ovoid acuminate, compressed only on one lateral side, parallel with hilum, second lateral side convex, 3.5-4.5 x 2.2-2.8 mm. Surface glabrous, semihyaline.** Both types are used as row material for popcorn.

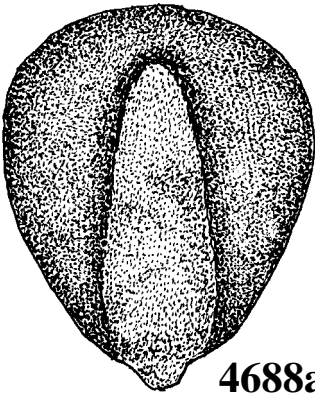
**4688h. *Zea mays* L. convar. *saccharata* Körn.** – in this case, all starch granules are replaced by sugary granules with very little starch contents. **Caryopses  $\pm$  prismatic, lateral compressed, central part of both lateral sides impressed, margin elevated, 9-11 x 8-10 mm. Surface wrinkly, slight lustrous, semihyaline, yellowish, light-orange or violetish.** This convar. is used as vegetable food preserving industry (unripe rolls) and for cookery.

## 175. ORCHIDACEAE

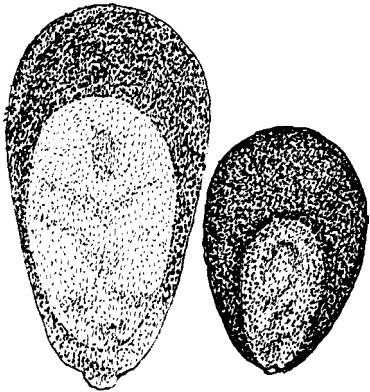
**4689. *Cypripedium calceolus* L.** – Perennial, rhizome stout, creeping, stem erect, 20-60 cm high, downy, scaly at base, slippery labium 3-4 cm long, yellow. **Seeds oval or rounded in external, hyaline, semitransparent, longitudinal testa, consisting of some cells arranged in a number of rows, 0.8-1.2 x 0.2-0.3 mm. Surface of testa grooved, lustrous, brown.  $2n = 20$ .** Native to circumpolar territories, leafy woods, shrubby slopes with moist, basic, mostly calcareous soils in warmer areas; throughout the Carpathians.



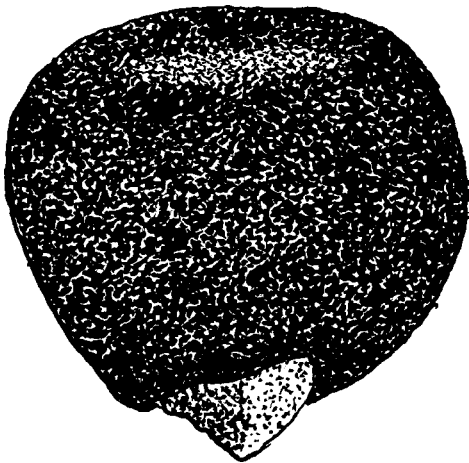
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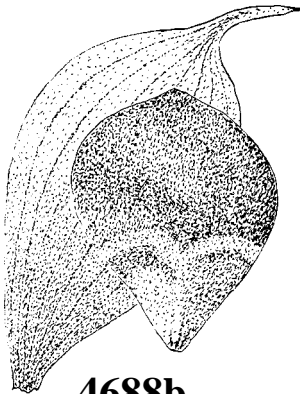
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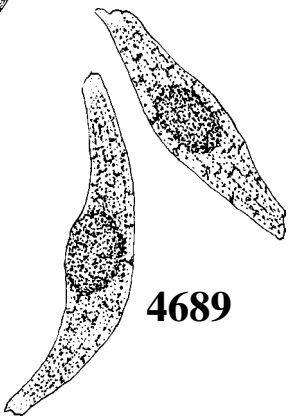
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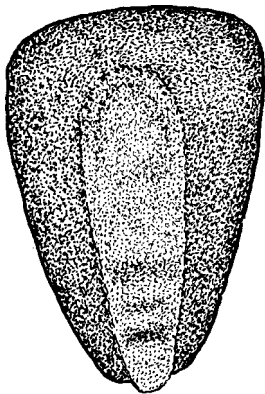
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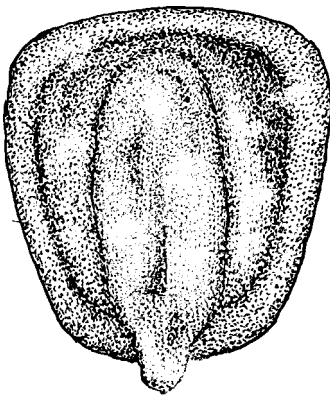
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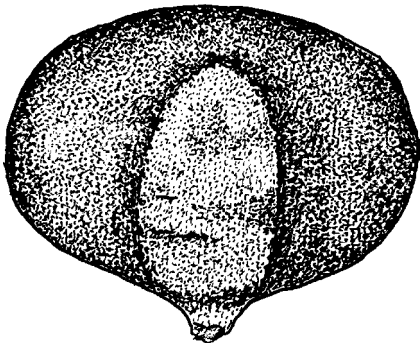
4689



4688e



4688h



4688c

**4690. *Cephalanthera damasonium*** (Mill.) Druce, *C. alba* (Crantz) Simonk. — Perennial, stem erect, bare, 20-60 cm high, completely leafed, flowers yellowish-white, large. **Seeds oval or roundish in external hyaline, transparent, longitudinal testa, consisting of numerous cells arranged in rows, 1.1-1.3 x 0.15-0.2 mm. Surface of testa shallow furrowed, lustrous, colourless, seed dark-brown. 2n = 36 (32).** Native to Europe, leafy woods, moist, humous, often calcareous stands; in warmer areas of the whole Carpathians.

**4691. *Cephalanthera longifolia*** (L.) Fritsch., *C. ensifolia* (Sw.) Rich. — Perennial, stem erect, 15-60 cm high, slender, bare, scaly at base, flowers minute, greenish-white. **Seeds rounded or slight oval, apex with short beak, external, longitudinal testa hyaline, transparent, consisting of numerous cells arranged in rows, 1.1-1.3 x c. 0.15 mm. Surface of testa shallow longitudinal striate, high lustrous, testa colourless, seed dark-brown. 2n = 32 (34).** Native to Eurasia, leafy woods, moist, humous, mostly calcareous grounds; in warmer areas of the whole Carpathians.

**4692. *Cephalanthera rubra*** (L.) Rich., *Serapias rubra* L. — Perennial, stem erect, 25-60 cm high, slender, downy above, flowers large pinkish-red or white. **Seeds oval or roundish, enclosed in external hyaline, longitudinal testa, 1.2-1.4 x c. 0.2 mm. Testa surface slight lustrous, pale-brown, seed dark-brown. 2n = 36 (48).** Native to Eurasia, light leafy woods and shrubberies, forest steppes of all Carpathian calcareous areas.

**4693. *Epipactis albensis*** Nováková et Rydlo — Perennial, stem 10-25 cm high, light-green, bare below, densely downy above, 2-4 leaves longer than internodes. **Seeds ellipsoid, apex a little broader, slight acuminate, bottom narrower, truncate, testa consisting from numerous cells arranged in some rows, 1-1.2 x c. 0.2 mm. Surface of seeds brown.** Endemic of the central Europe, in lowland shady forests, along river streams. Au, Cz, Pl, Sk.

**4694. *Epipactis atrorubens*** (Hoffm.) Besser, *E. atropurpurea* auct. non Raf. — Perennial, rhizome short, stem erect, 30-80 cm high, scaly below, hirsute above, flower reddish-purple. **Seeds slight oval or rounded in external longitudinal, hyaline, semi-transparent testa, 0.9-1 x c. 0.3 mm. Testa surface longitudinal furrowed, high lustrous, colourless, seeds pale-brown. 2n = 40.** Native to Euro-Siberia,

light leafy and pine-woods, overgrown rocks and shrubby slopes, often calcareous grounds; in all Carpathian territories.

**4695. *Epipactis futakii*** Mered'a et Potůček — Perennial, stems erect, 13-60 cm high, violetish at base, mostly leafless in lower half, leaves ovoid-lanceolate, 6-10 x 1.7-4 cm, flowers permanently closed. **Seeds very similar to another species of *Epipactis*, but testa a little shorter and narrower, oval, 1.1-1.2 x 0.1-0.15 mm. Surface of testa longitudinal ribbed, brown, seeds pale-yellowish. 2n = 40.** Native to the West Carpathians; in leafy forests at sea level altitudes of 300-550 m; neutral or weakly acid and reinforced screes. Sk.

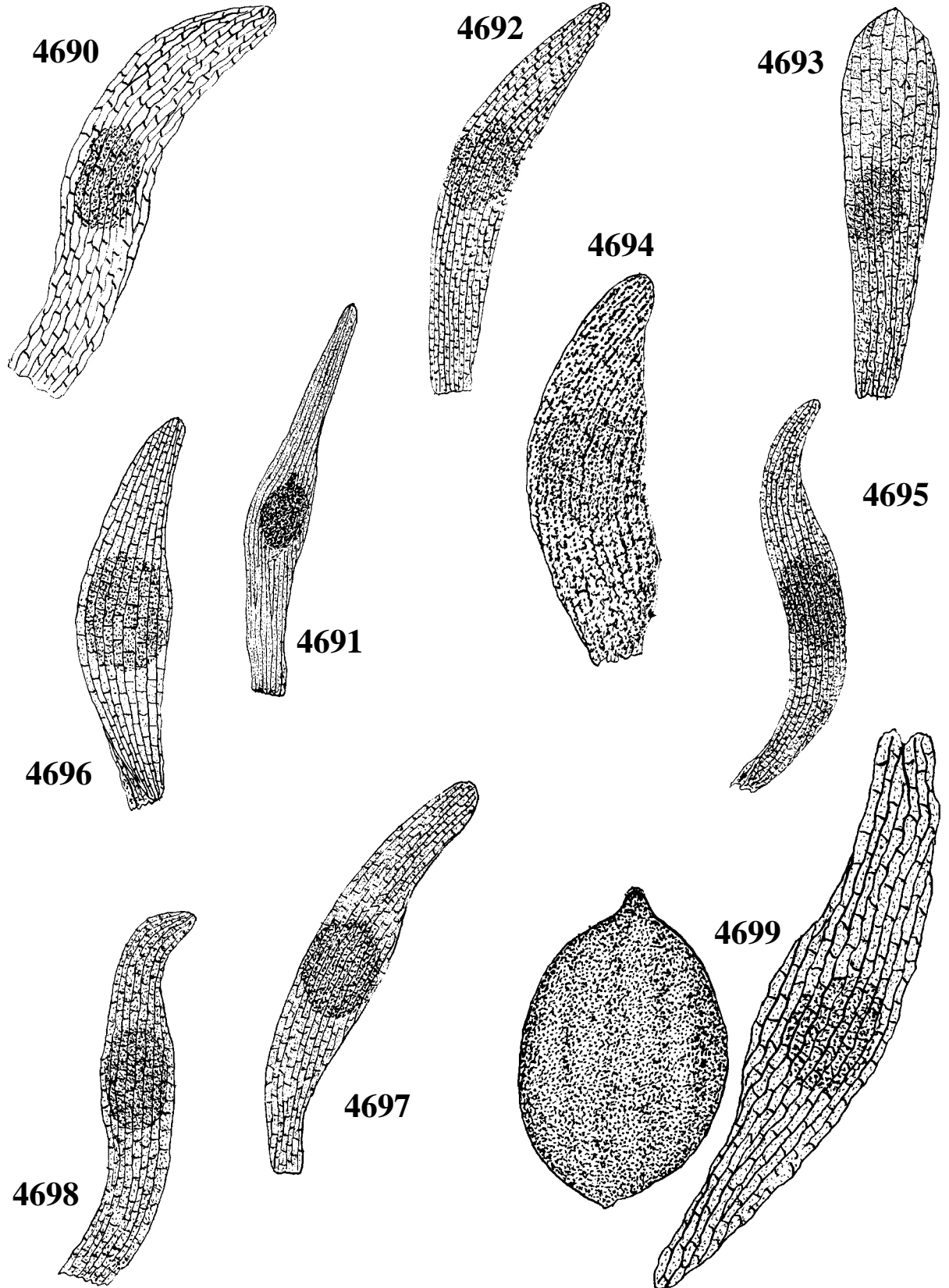
**4696. *Epipactis greuteri*** H. Baumann et Kunkele — Perennial, stems single or in tufts, 13-70 cm high, leaves 2-9, 4-11 x 1.2-5.5 mm, flowers yellowish-green. **Seeds oval or rounded in external, hyaline, transparent, longitudinal testa, consisting of numerous cells arranged in a few rows, 1-1.3 x 0.25-0.35 mm. Surface of testa shallow furrowed, lustrous, pale-yellowish, seeds brown.** Native to Europe; fir-beach forests on clay-limestone base rocks, at level altitudes of 460-620 m. Sk.

**4697. *Epipactis helleborine*** (L.) Crantz, *E. latifolia* (L.) All. — Perennial, stem erect 20-100 cm, hairless below, downy above, base scaly, all leafed, flowers pinkish-violet. **Seeds oval or spherical in external longitudinal, hyaline testa with distinct cells, 1.1-1.3 x c. 0.2 mm. Testa surface longitudinal striate, high lustrous, faint brown, seeds pale-brown. 2n = 36, 38, 40, 44.** Native to Eurasia, leafy woods and shrubberies, lowland forests, boundaries, from lowland to montane zones; in all Carpathian territories.

**4698. *Epipactis komoricensis*** Mered'a — Perennial, stems 20 to 80 cm high, base rarely violetish, leaves yellowish- or light-green, flowers violet. **Seeds oval or roundish in external, hyaline, transparent, longitudinal testa consisting of numerous cells arranged in a few rows, 1.1-1.3 x c. 0.3 mm. Surface of testa shallow striate, lustrous, pale-yellowish, seeds brown.** Native to the West Carpathians; leafy and coniferous forests of lowland and submontane zones, in calcareous stands. Sk.

**4699. *Epipactis leptochila*** (Godfery) Godfery, *Helleborine leptochila* (Godfery) Druce — Perennial, stems single or in groups, erect, 20-90 cm, hirsute above,





flowers yellowish-green. **Seeds ellipsoid or spherical, apex with small beak, c. 0.22 x 0.15 mm, external testa longitudinal, hyaline, cells distinct, 1.3-1.5 x 0.25-0.3 mm. Testa surface longitudinal striate, high lustrous, smooth, yellowish to pale-brown, seeds brown.  $2n = 40$  (36).** Native to Europe, beech-woods, moist, calcareous or dolomite, humous grounds, rare. Sk.

**4700. *Epipactis microphylla* (Ehrh.) Sw., *Helleborine microphylla* (Ehrh.) Schinz et Thell.** — Perennial, stem erect, 15-50 cm, hirsute, flowers yellowish-green. **Seeds oval or rounded in external, longitudinal, hyaline testa, 1.2-1.4 x 0.3-0.4 mm. Testa surface longitudinal striate, high lustrous, colourless, seeds pale-brown.  $2n = 40$ .** Native to Europe, leafy woods, shrubberies, forest margins, calcareous stands in warmer areas, upland to montane zones. Hu, Pl, Ro, Sk, Uk.

**4701. *Epipactis muelleri* Godfery, *E. viridiflora* auct. non Rchb.** — Perennial, stems single or in grounds, erect 20-85 cm high, slightly hirsute or hairless, scaly, flowers violetish-green. **Seeds ellipsoid or spherical in longitudinal, hyaline testa, cells distinct, 0.9-1.1 x 0.15-0.2 mm. Testa surface longitudinal furrowed, high lustrous, yellowish, seeds pale-brown.  $2n = 36$ .** Native to Europe, sunny slopes, forest margins, light woods, mostly calcareous warm grounds. Hu, Sk.

**4702. *Epipactis palustris* (L.) Crantz, *E. longifolia* All.** — Perennial, stems single, erect, 10-70 cm high, grooved, scaly below, downy above, flowers large, brown or purplish-white. **Seeds rounded or oval in longitudinal, hyaline testa, cells indistinct, 1.2-1.6 x c. 0.2 mm. Testa surface deep longitudinal striate, high lustrous, colourless, seeds pale-brown.  $2n = 40$  (44, 46, 48).** Native to Eurasia, wet and peatbog stands, springheads, peaty meadows; in all Carpathian regions.

**4703. *Epipactis pontica* Taubenheim** — Perennial, stems thin, stiff, 10-25 cm high, downy, flowers greenish. **Seeds ellipsoid in external, longitudinal, hyaline, semitransparent testa, cells distinct, 1-1.1 x c. 0.15 mm. Testa surface longitudinal striate, high lustrous, pale-yellowish, seeds pale-brown.** Native to Europe, dry shady oak- or slightly moist beech-forests, mostly acid substrates, from upland to montane zones. Sk.

**4704. *Epipactis pseudopurpurata* Mered'a** — Perennial, a taxon closely related to *E. purpurata*.

The most important diagnostic feature is the structure of the column, stem one, rarely two, erect, 10-40 cm high, thin, downy above, violet. **Seeds rounded or ellipsoid in external, longitudinal, hyaline, transparent, rounded on apex, open below testa, cells of the testa indistinct, 1.5-1.7 x c. 0.2 mm. Testa surface longitudinal striate, pale-yellowish, seed pale-brown.  $2n = c. 40$ .** Native to central Europe, leafy forests at sea level altitudes of 370-850 m. Sk.

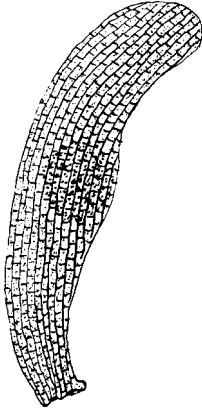
**4705. *Epipactis purpurata* Sm., *E. sessilifolia* Peterm.** — Perennial, stems in groups, scaly below, 20-80 cm high, flowers large, greenish-violet-white. **Seeds oval or roundish in external longitudinal, hyaline testa, 1.1-1.2 x 0.25-0.3 mm. Testa surface longitudinal striate, high lustrous, slight brown, seeds pale-brown.  $2n = 40$ .** Native to Europe, shady leafy woods, alkali humous stands; throughout the Carpathians.

**4706. *Epipactis tallosii* Molnár et Robatsch** — Perennial, stems 15-55 cm high, with 2-20 greenish-pink flowers. **Seeds oval in external, longitudinal hyaline, semitransparent testa, cells slight distinct, 0.8-1 x 0.12-0.15 mm. Testa surface longitudinal furrowed, high lustrous, yellowish-white, seed pale-brown.** Native to Europe, lowland poplar-woods. Hu, Sk.

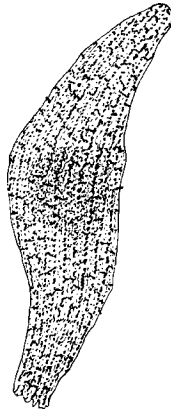
**4707. *Limodorum abortivum* (L.) O. Schw., *Orchis abortiva* L.** — Perennial, stem erect, stout, 20-80 cm, leaves scaly, flowers whitish-violet. **Seeds ellipsoid in external, longitudinal, hyaline, at apex rounded, below open testa, testa cells distinct, 1.1-1.3 x 0.4-0.5 mm. Testa surface longitudinal striate, high lustrous, white or yellowish, seeds pale-brown.  $2n = 56, 64$ .** Native to Europe, light woods, shrubberies, forest steppes, moist and dry, basic, humous, stony grounds, rare in the warmest areas. Hu, Ro, Sk, Uk.

**4708. *Listera ovata* (L.) R. Br., *Ophrys ovata* L.** — Perennial, stem erect, 20-60 cm, scaly at base, 4-angular, bare, glandular-downy, flowers yellowish-green. **Seeds ellipsoid or spherical in external hyaline testa, 0.7-0.9 x c. 0.2 mm. Testa surface longitudinal ribbed, high lustrous, colourless, seeds yellowish-brown.  $2n = 34$ .** Native to Eurasia, moist leafy lowland woods and shrubberies, meadows and peatbogs; in all Carpathian territories.

**4709. *Neottia nidus-avis* (L.) L. C. Rich., *Ophrys nidus-avis* L.** — Perennial, stems erect, 20-50 cm high, grooved below, bare or glandular-downy above,



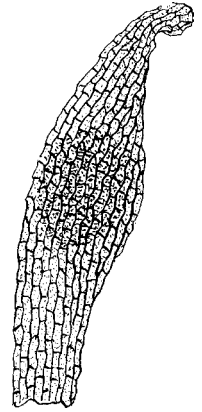
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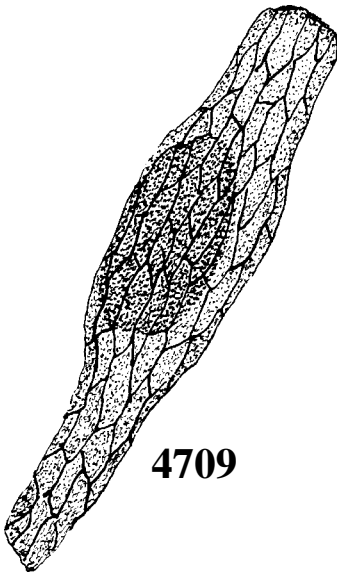
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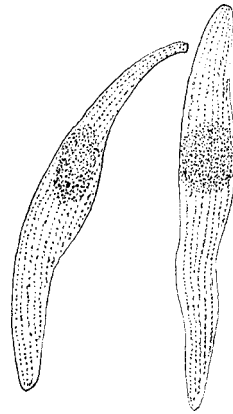
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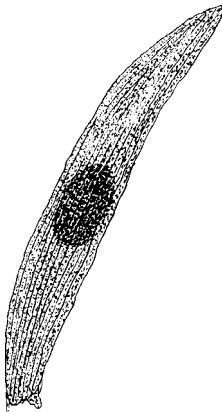
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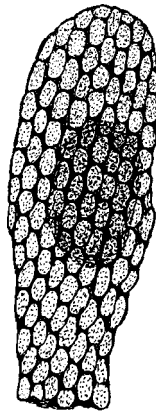
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**4706**



**4704**



**4707**



**4708**

flowers yellowish-brown. **Seeds oval in external, longitudinal hyaline testa, 1.1-1.3 x 0.25-3 mm. Testa surface high lustrous, smooth, pale-brown, seeds slight dark-brown.  $2n = 36$ .** Native to Euro-Siberia, leafy and coniferous, humous woods and shrubberies, mostly calcareous stands; throughout the Carpathians.

**4710. *Spiranthes spiralis* (L.) Chevall., *Epipactis spiralis* (L.) Crantz** – Perennial, stems erect, 7-35 cm high, thin, glandular-downy above, flowers whitish-green. **Seeds ellipsoid in external, longitudinal, hyaline testa, 0.5-0.6 x 0.1-0.15 mm. Testa surface longitudinal striate, high lustrous, pale-brown to colourless, seeds dark-brown.  $2n = 30$ .** Native to Europe, moist to peaty meadows. Hu, Mo, Pl, Ro, Sk, Uk.

**4711. *Goodyera repens* (L.) R. Br. ex Ait., *Epipactis repens* (L.) Crantz** – Perennial, stems 10-30 cm, ascendent, mostly in groups, leafy below, scaly above, glandular-downy, flower minute, whitish. **Seeds spherical in external, longitudinal, hyaline testa, 0.6-0.8 x 0.15 mm. Testa surface smooth, lustrous, brownish, seeds brown.  $2n = 30$  (32-40).** Native to circumpolar territories, shady, mountain, coniferous or mixed woods, mostly non-calcareous, dryer grounds; throughout the Carpathians.

**4712. *Platantera bifolia* (L.) L. C. Rich., *Orchis bifolia* L.** – Perennial, bulbs 2, ovoidal, stem erect, 20-50 cm, hollow,  $\pm$  grooved, scaly at base, flowers greenish-white. **Seeds ellipsoid in external, longitudinal, hyaline testa, testa cells faint distinct, 0.8-0.9 x 0.15-0.25 mm. Testa surface wrinkly, lustrous, pale-brown, seeds dark-brown.  $2n = 42$ .** Native to Eurasia, light margins of leafy and coniferous woods, shrubby slopes, meadows, pastures, silicate, stony stands; throughout the Carpathians.

**4713. *Platantera chlorantha* (Custer) Rchb. *Orchis chlorantha* Custer** – Perennial, stem strictly erect, 20-60 cm, grooved, inflorescence sparse, flowers greenish-white. **Seeds ellipsoid in external, longitudinal, hyaline testa, cells slight distinct, 0.7-0.8 x 0.15-0.2 mm. Testa surface smooth, high lustrous, brown, seeds dark-brown.  $2n = 42$ .** Native to Europe, lighter leafy, rarely coniferous wood margins and shrubberies, wet and peaty meadows; in all Carpathian territories.

**4714. *Platantera hyperborea* (L.) Lindley** – Perennial, plant 6-35 cm high, flower numerous,

fragrant. **Seeds spherical in external, oblong, hyaline, transparent testa, cells distinct, 0.7-0.8 x 0.2-0.3 mm. Testa surface shell-like, striate, glossy, yellowish-brown, seeds pale-brown.  $2n = 84$ .** Native to arctic and subarctic America, meadows and moorlands; in the Carpathians very rarely cultivated for ornament in rock-gardens.

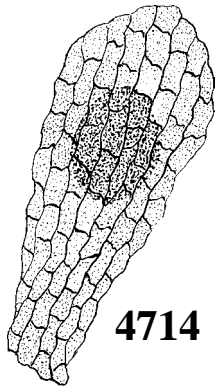
**4715. *Coeloglossum viride* (L.) C. J. Hartm., *C. vailantii* Schur** – Perennial, bulbs prolonged flattish, stem 6-35 cm high, erect, angular, leafy, flowers yellowish-green. **Seeds oval in external, longitudinal, hyaline testa, cells distinct, 0.4-0.6 x 0.1-0.2 mm. Testa surface slight striate, strong lustrous, yellowish-brown, seeds brown.  $2n = 40$  (80).** Native to circumpolar territories, meadows, light woods, mountains planes and ridges, moist and dry, basic or faintly acid soils; throughout the Carpathians.

**4716. *Nigritella nigra* (L.) Rchb. fil., *Satyrium nigrum* L.** – Perennial, stem 8-20 cm, leaves linear, flowers minute, blackish-violet. **Seeds spherical in external, clavellate hyaline testa, testa cells distinct, 0.3-0.4 x 0.15-0.25 mm. Testa surface smooth, striate, lustrous, pale-brown, seeds dark-brown.  $2n = 64$ .** Native to Europe, moist mountain meadows and pastures, calcareous, humous stands, in subalpine and alpine zones. Pl, Ro, Sk, Uk.

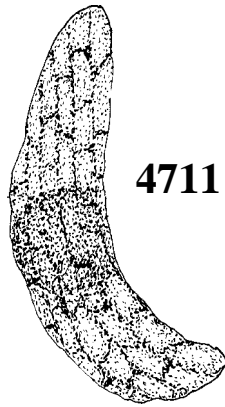
**4717. *Gymnadenia conopsea* (L.) R. Br., *G. transsilvanica* Schur, *Orchis conopsea* L.** – Perennial, stem erect, 20-40 cm high, slender, base with 1-2 scales, flowers flesh-rose. **Seeds spherical in external, longitudinal, hyaline testa, 0.4-0.5 x c. 0.2 mm. Testa surface striate, high lustrous, pale-brown, seeds dark-brown.  $2n = 40$ .** Native to Eurasia, moist and peaty meadows, springheads, shrubby slopes, basic, neutral and acid, moist and dryer stands; in all Carpathian regions.

**4718. *Gymnadenia odoratissima* (L.) Rich., *Orchis odoratissima* L.** – Perennial, stem erect, 15-50 cm high, glabrous below, grooved above, flowers light-rose. **Seeds roundish in external, longitudinal, hyaline testa, 0.4-0.5 x 0.15-0.2 mm. Testa surface striate, high lustrous, pale-brown, seeds dark-brown.  $2n = 40$ .** Native to Europe, dry and moist meadows, pastures, forest clearings and margins, sunny overgrown rocks of upland and montane zones; throughout the Carpathians.

**4719. *Pseudorchis albida* (L.) Á. et D. Löve, *Gymnadenia albida* (L.) Rich.** – Perennial, stems



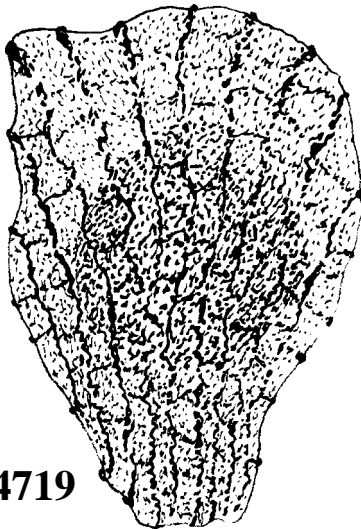
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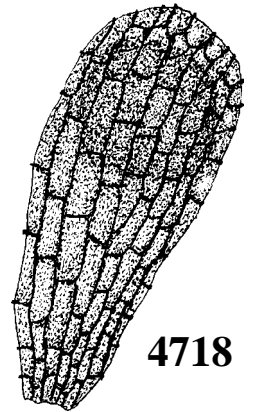
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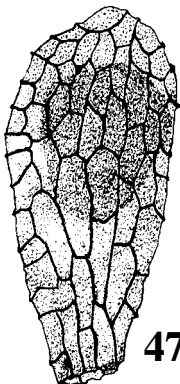
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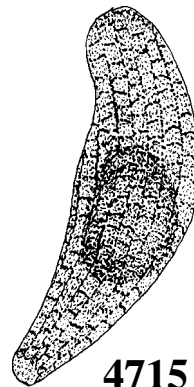
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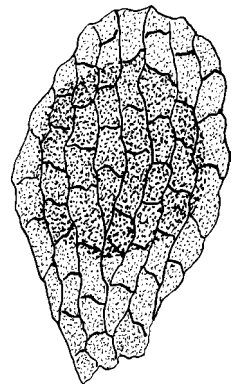
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erect, 10-40 cm, base with 2-3 scales, flowers greenish. **Seeds spherical in external, longitudinal, hyaline testa, testa cells semidistinct, 0.4-0.5 x 0.2-0.3 mm. Testa surface slight striate, high lustrous, pale-brown, seeds dark-brown. 2n = 42.** Native to Europe, mountain meadows and planes, reinforced screes, humous, non-calcareous grounds, rare in the montane zone. Hu, Pl, Ro, Sk, Uk.

**4720. *Chamorchis alpina* (L.) L. C. Rich., *Ophrys alpina* L.** – Perennial, stem erect, 5-15 cm high, grooved, base with 2 scales, flowers yellowish-green. **Seeds spherical with hyaline, semitransparent testa, testa cells distinct, 0.3-0.4 x 0.15-0.25 mm. Testa surface striate, high lustrous, pale-brown, seeds dark-brown. 2n = 42.** Native to Europe, high-mountain meadows, shallow, stony, calcareous and humous grounds. Pl, Ro, Sk.

**4721. *Herminium monorchis* (L.) R. Br., *Ophrys monorchis* L.** – Perennial, single stem erect, 8-30 cm high, thin, slightly angular, 2 scales at base, flowers yellowish-green. **Seeds ± spherical in external, longitudinal, hyaline testa, testa cells distinct, 0.4-0.5 x 0.15-0.2 mm. Testa surface striate, high lustrous, faint pale-brown, seeds pale-brown. 2n = 40.** Native to Eurasia, dry meadows, pastures and meadows, springheads, basic, moist to wet, humous soils; in all Carpathian regions.

**4722. *Ophrys apifera* Huds.** – Perennial, stem erect, cylindric, 20-70 cm high, flowers pinkish-brown. **Seeds globular or slight oval in external, longitudinal, hyaline testa, cells visible, 0.6-0.7 x c. 0.15 mm. Testa surface smooth, striate, lustrous, pale-brown, seeds brown. 2n = 36.** Native to Europe, sunny, grassy and shrubby slopes, warmed, basic, arid, humous stands of the upland zone. Hu, Ro, Sk, Uk.

**4723. *Ophrys fusca* Link** – Perennial, stem 10-20 cm high, cylindric, upper part weakly angular, greenish-yellow. **Seeds spherical shaped in external, longitudinal, hyaline, transparent testa, cells cylindric, long, 0.65-0.75 x 0.15-0.2 mm. Testa surface smooth, longitudinal striate, lustrous, pale-brown, seeds dark-brown.** Native to central and eastern Europe, sunny, rocky, grassy stands, forest clearings and cut-over areas, moist lawns on calcareous substrates. Ro.

**4724. *Ophrys insectifera* L., *O. muscifera* Huds.** – Perennial, stem erect, 15-20 cm, thin, with 2-3 leaves at base, leafless above. **Seeds ellipsoid in external,**

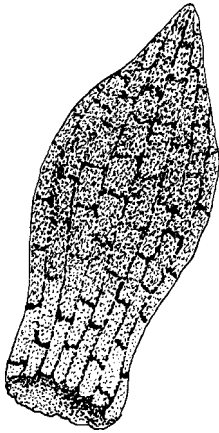
**longitudinal, hyaline testa, cells slight distinct, 0.5-0.6 x c. 0.1 mm. Testa surface smooth, faint striate, lustrous, faint-brown, seeds pale-brown. 2n = 36.** Native to Europe, scarce in pine-woods, shrubby slopes, pastures, forest steppes, calcareous and humous, dry in summer stands; throughout the Carpathians.

**4725. *Anacamptis pyramidalis* (L.) Rich., *Orchis pyramidalis* L.** – Perennial, stem erect, 20-60 cm high, slender, leafy, scaly at base, grooved above, flower spike pyramidal, dense, flowers luminous-red. **Seeds spherical in external, longitudinal, hyaline testa, cells distinct, 0.4-0.5 x 0.15-0.2 mm. Testa surface glabrous, longitudinal striate, lustrous, pale-brown, seeds brown. 2n = 36.** Native to Europe, sunny, semisteppe meadows, forest steppes, light woods, rarely moist meadows, calcareous and humous stands dry in summer, from lowland to alpine zones. Hu, Mo, Pl, Ro, Sk, Uk.

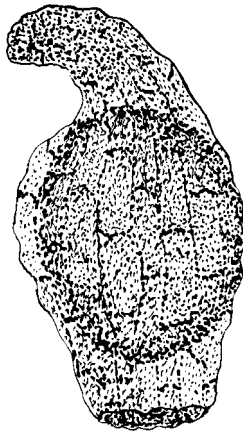
**4726. *Traumsteinera globosa* (L.) Rchb., *Orchis globosa* L.** – Perennial, stem erect, 15-60 cm high, with 2-3 scales at base, flowers dirty-rose or reddish-violet. **Seeds spherical in external short longitudinal, hyaline, semitransparent testa, cells slight distinct, 0.4-0.5 x 0.2-0.3 mm. Testa surface wrinkly, striate, lustrous, pale-brown, seeds dark-brown. 2n = 42.** Native to Europe, grassy and shrubby slopes, mountain meadows and pastures, basic to slightly acidic and humous stands. Br, Hu, Pl, Ro, Sk, Uk.

**4727. *Orchis coriophora* L., *Anteorchis coriophora* (L.) Klein et Stack** – Perennial, stem erect, 15-30 cm, finely grooved, scaled at base, leafy above, flowers greyish-purple. **Seeds spherical or slight ellipsoid in external, longitudinal, hyaline testa, testa cells faint distinct, 0.6-0.8 x 0.15-0.25 mm. Testa surface longitudinal striated and ribbed, high lustrous, yellowish-brown, seeds dark-brown. 2n = 38.** Native to Eurasia, meadows and pastures, moist, basic to weakly acid, non-calcareous soils; throughout the Carpathians.

**4728. *Orchis elegans* Heuff., *O. laxiflora* subsp. *elegans* (Heuff.) Soó** – Perennial, stems 50-100 cm high, leafy, flower ear sparse, flowers large, violet-pink to red-purple. **Seeds spherical in external, hyaline, transparent testa, cells distinct, 0.6-0.8 x 0.15-0.2 mm. Testa surface glossy, pale-brown, seeds brown. 2n = 42.** Native to southeastern Europe,



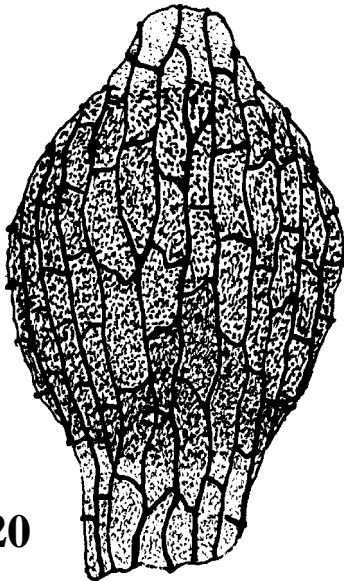
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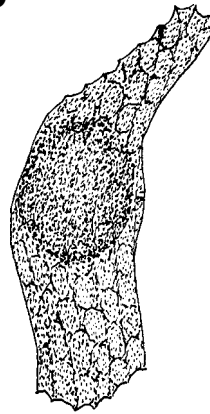
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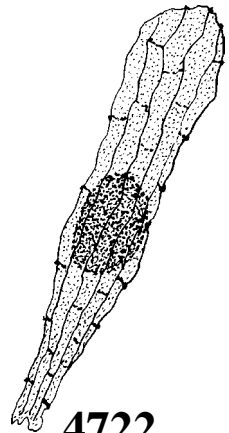
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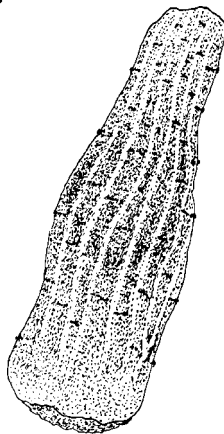
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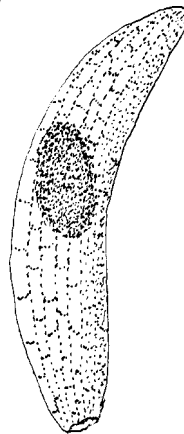
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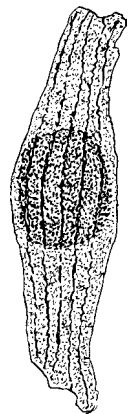
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4728

western and central Asia, wet meadows, marshy lands. Hu, Ro, Sk, Uk.

**4729. *Orchis mascula* (L.) L., *O. ovalis* F. W. Schmidt** – Perennial, stem erect, 15-50 cm high, scaled at base, lower half densely leafy, leafless above, flowers reddish-violet. **Seeds mostly spherical in external, hyaline, semitransparent testa, cells distinct, 0.4-0.5 x 0.15-0.25 mm. Testa surface smooth, high lustrous, yellowish-brown, seeds pale-brown. 2n = 42.** Native to Europe, poor meadows and pastures, shrubby slopes, light woods, neutral soils; in all Carpathian regions.

**4730. *Orchis militaris* L., *O. rivini* Gouan** – Perennial, stems erect, 20-65 cm high, faintly grooved, scaly at base, flowers whitish-violet, purplish spotted. **Seeds spherical or slight ellipsoid in external, longitudinal, hyaline testa, cells distinct, 0.25-0.3 x 0.1-0.15 mm. Testa surface longitudinally striate, lustrous, yellowish-brown, seeds brown. 2n = 42.** Native to Euro-Siberia, light leafy, lowland woods and shrubberies, dryer moor-meadows, of lowland and upland zones; in all Carpathian territories.

**4731. *Orchis morio* L.** – Perennial, stem erect, 8-40 cm high, finely grooved, scaly at base, lower half leafy, leafless above, flowers dark-violet. **Seeds ellipsoid in external, longitudinal, hyaline testa, cells distinct, 0.6-0.8 x 0.15-0.2 mm. Testa surface furrowed and ribbed, high lustrous, pale-brown, seeds dark-brown. 2n = 36.** Native to Eurasia, meadows, pastures, shrubby slopes, moist, basic to faintly acid grounds; in all Carpathian regions.

**4732. *Orchis pallens* L.** – Perennial, stems 15-35 cm high, erect, with sheath in lower part and leaves above, naked in the uppermost part, leaves oblong or oblong-ovate, flowers yellow. **Seeds spherical in external, oblong, hyaline testa, cells of the testa oblong, 0.35-0.45 x 0.15-0.2 mm. Testa surface glossy, light-brown, seeds pale-brown. 2n = 40 (42).** Native to Europe, wood clearings, light, leafy forests and shrubberies, rarely meadows and pastures. Hu, Pl, Ro, Sk.

**4733. *Orchis palustris* Jacq., *O. laxiflora* subsp. *palustris* (Jacq.) Aschers. et Graebn.** – Perennial, stems 25-60 cm high, leafed, leaves erect up to 10 mm wide, flowers large, violet-pink to reddish-purple. **Seeds ellipsoid in external, longitudinal, hyaline testa, cells distinct, 0.8-0.9 x 0.1-0.15 mm. Testa surface longitudinal striate, lustrous, pale-brown, seeds dark-brown. 2n = 42.** Native to Europe, moist

and swampy meadows, saline soils, stagnant water-banks, wet and basic stands. Hu, Mo, Pl, Ro, Sk, Uk.

**4734. *Orchis papilionacea* L., *O. rubra* Jacq.** – Perennial, stems 10-40 cm high, cylindric, erect, reddish-brown in upper-part, flowers reddish-brown to red. **Seeds spherical in external, longitudinal, hyaline testa, cells indistinct, oblong, 0.5-0.6 x 0.1-0.15 mm. Testa surface longitudinal striate, seeds dark-brown. 2n = 32.** Native to southern Europe, calcite and non-calcite, nutrient-poor soils, light woods and shrubberies of lowlands up to 1800 m. Ro.

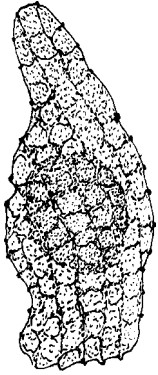
**4735. *Orchis purpurea* Huds., *O. fusca* Jacq.** – Perennial, stem erect, 30-80 cm high, leafy below, leafless above, flowers whitish with red hairs and spots. **Seeds ellipsoid in external, longitudinal, hyaline testa, cells slight distinct, 0.5-0.6 x 0.15-0.25 mm. Testa surface longitudinal faint striate, high lustrous, pale-brown at apex and colourless at bottom, seeds brown. 2n = 42.** Native to Europe, light, leafy woods and shrubberies, forest steppes, shrubby slopes. Hu, Mo, Pl, Ro, Sk, Uk.

**4736. *Orchis simia* Lam., *O. tephrosanctos* Vill.** – Perennial, stems cylindric, erect, 25-45 cm high, with rosette of 2-5 leaves, flowers whitish-red. **Seeds mostly spherical in external, longitudinal testa semitransparent in upper and central parts, bottom transparent, 0.4-0.5 x 0.15-0.25 mm. Testa surface lustrous, yellowish-brown in upper and colourless in bottom part, seeds dark-brown. 2n = 42.** Native to Eurasia, lawns, cut-over areas and wood margins, shrubberies, on calcareous stands. Hu, Ro.

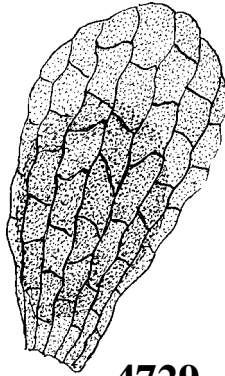
**4737. *Orchis tridentata* Scop., *O. variegata* All.** – Perennial, stems erect, 12-40 cm high, bare, scaly at base, leafless above, flowers light-rose, spotted purplish. **Seeds mostly rounded in external, longitudinal, hyaline, semitransparent testa, testa cells faint distinct, 0.4-0.6 x 0.15-0.2 mm. Testa surface ribbed, smooth, lustrous, pale-brown, seeds dark-brown. 2n = 42.** Native to Europe, meadows, sunny, grassy and shrubby slopes, dryer or slightly wet and basic soils. Hu, Pl, Ro, Sk, Uk.

**4738. *Orchis ustulata* L.** – Perennial, stem erect, 10-30 cm high, slender, with 1-3 scales at base, densely below, sparsely above leafed, flowers whitish, reddish-dotted. **Seeds globular or oval in external, hyaline, longitudinal testa, cells distinct, 0.4-0.5 x**





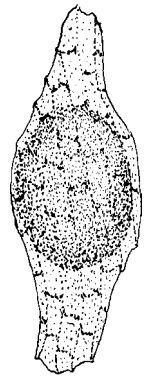
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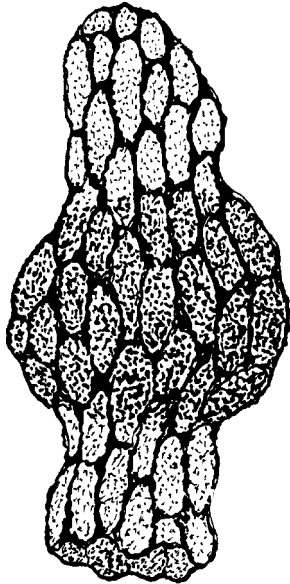
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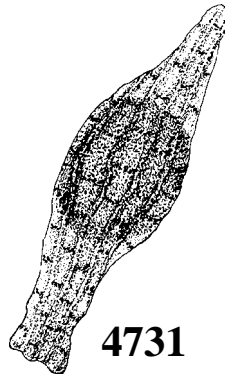
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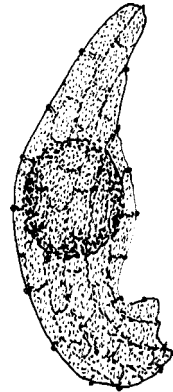
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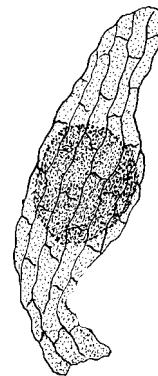
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**0.2-0.3 mm. Testa surface longitudinal wrinkly, high lustrous, yellowish-brown, seeds dark-brown.  $2n = 42$ .** Native to Euro-Siberia, dryer meadows, boundaries, grassy and shrubby slopes, rarely moist meadows and light woods; in all Carpathian regions, spreading from the upland up to the montane zone.

**4739. *Dactylorhiza cruenta* (O. F. Müll.) Soó, *Orchis cruenta* O. F. Müll.** — Perennial, stems 10-40 cm, hollow, with 2 leaves at base, flowers purple. **Seeds spherical in external, longitudinal, hyaline, transparent testa, cells distinct, 0.65-0.75 x 0.2-0.3 mm. Testa surface high lustrous, yellowish-brown, seeds brown.  $2n = 80$ .** Native to the Carpathian and Balkan mountains, moist lawns, swamps, peatbogs of montane to subalpine zones. Br, Pl (?).

**4740. *Dactylorhiza fuchsii* (Druce) Soó, *Orchis fuchsii* Druce** — Perennial, stems erect, 15-80 cm high, thin, full, scaly at base, flowers light rose-purple. **Seeds ellipsoid in external, longitudinal, hyaline testa, cells irregular, distinct, 0.8-0.9 x 0.15-0.2 mm. Testa surface longitudinal wrinkly, high lustrous, light-pale, seeds pale-brown.  $2n = 40$ .** Native to Euro-Siberia, meadows, pastures, peatbogs, woods, on moist, basic, calcareous soils. Br, Pl, Ro, Sk, Uk.

**4741. *Dactylorhiza incarnata* (L.) Soó, *Orchis incarnata* L.** — Perennial, bulbs flattish, stem stout, hollow, erect, 30-90 cm high, slightly grooved, scaly at base, leafy, flowers red, rarely white. **Seeds globular in external, longitudinal, hyaline, semitransparent testa, cells irregular, distinct, 0.6-0.8 x 0.2-0.3 mm. Testa surface lustrous, pale-brown, seeds brown.  $2n = 40$ .** Native to Eurasia, swampy meadows, marshes and swamps, peatbogs, stagnant water banks, calcareous and non-calcareous habitats. Hu, Pl, Ro, Sk, Uk.

**4742. *Dactylorhiza maculata* (L.) Soó, *Orchis maculata* L.** — Perennial, stem erect, 30-60 cm high, slender, full, scaled at base, flowers pale-violet, spotted. **Seeds ellipsoid or spherical in external, longitudinal, hyaline, semitransparent testa, cells faint distinct, 0.9-1.1 x 0.15-0.2 mm. Testa surface longitudinal striate, high lustrous, yellowish-brown, seeds pale-brown.  $2n = 80$ .** Native to Europe, wet and moist meadows and pastures, peatbogs, forest brookbanks. Br, Hu, Pl, Ro, Sk, Uk.

**4743. *Dactylorhiza majalis* (Rchb.) Hunt et Summerh., *Orchis majalis* Rchb., *O. latifolia* L.** — Perennial, stem stout, 10-70 cm high, hollow,

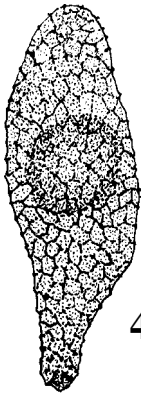
grooved reddish above, flowers purplish-violet. **Seeds spherical or slightly ellipsoid in external, longitudinal, hyaline, semitransparent testa, cells distinct, 0.9-1 x 0.15-0.25 mm. Testa surface longitudinal striate, high lustrous, pale-brown, seeds brown.  $2n = 80$ .** Native to Eurasia, moist to wet meadows, springheads, moors, non-calcareous habitats. Hu, Pl, Ro, Sk, Uk.

**4744. *Dactylorhiza sambucina* (L.) Soó, *Orchis sambucina* L.** — Perennial, stem erect, 10-40 cm high, full, bare, grooved above, scaly at base, flowers purplish-red. **Seeds spherical or slight ellipsoid in external longitudinal, hyaline testa, cells faint distinct, 0.5-0.6 x 0.15-0.25 mm. Testa surface longitudinal, weak striate, lustrous, yellowish-brown, seeds pale-brown.  $2n = 40, 42$ .** Native to Europe, light leafy woods and shrubberies, dryer meadows and pastures; in the whole Carpathians.

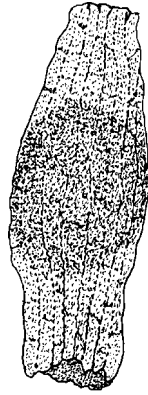
**4745. *Himantoglossum adriaticum* H. Baumann, *H. hircinum* auct. non (L.) K. Koch** — Perennial, stem stout, erect, 30-80 cm high, leafy, slightly angular above, leaves ovoidal, flowers whitish-red, middle lobe up to 5 cm long. **Seeds ellipsoid in external, longitudinal, hyaline semitransparent testa, cells distinct, 0.3-0.4 x 1.2-1.8 mm. Testa surface high lustrous, light-reddish, seeds reddish-brown.  $2n = 36$ .** Native to Europe, dryer, warmed, humous, calcareous grounds. Hu, Sk.

**4746. *Malaxis monophyllos* (L.) Lindl., *Ophrys monophyllos* L.** — Perennial, stem erect, slender, 7-40 cm high, 3-angular above, mostly 1-leafed, spike cylindric multiflowered, flowers minute, yellowish-green. **Seeds spherical in external, longitudinal, hyaline, transparent testa, cells distinct, 0.1-0.15 x c. 0.05 mm. Testa surface undulate, slight lustrous, yellowish-white to colourless, seeds yellowish-white.  $2n = 28$ .** Native to circumpolar territories, moist to wet moor meadows, wood and road margins, shrubberies, calcareous stands from upland up to montane zones. Br, Hu, Pl, Ro, Sk, Uk.

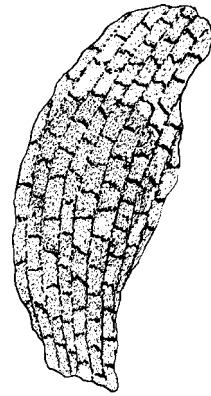
**4747. *Liparis loeselii* (L.) L. C. Rich., *Pseudorchis loeselii* (L.) Grey** — Perennial, stem erect, 6-20 cm high, scaly at base, flower spike poor, flowers minute, light yellowish-green. **Seeds spherical in external, clubform or longitudinal, hyaline, transparent testa, cells distinct, 0.3-0.4 x 0.1-0.2 mm. Testa surface undulate, lustrous, yellowish-white, seeds yellowish-white.  $2n = 26$ .** Native to circum-



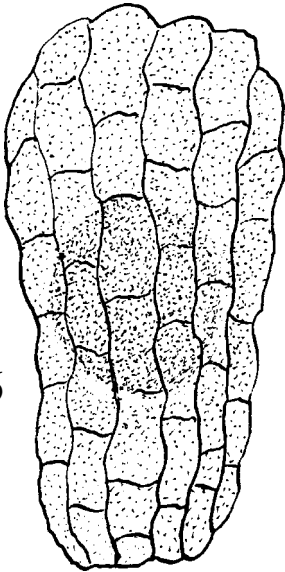
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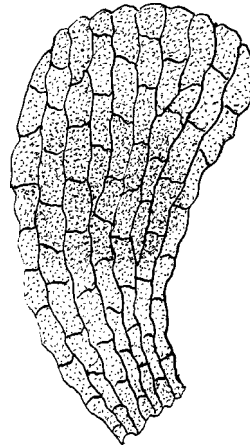
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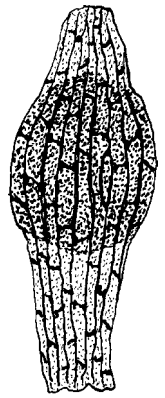
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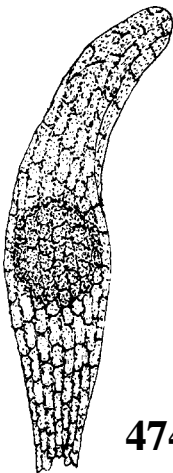
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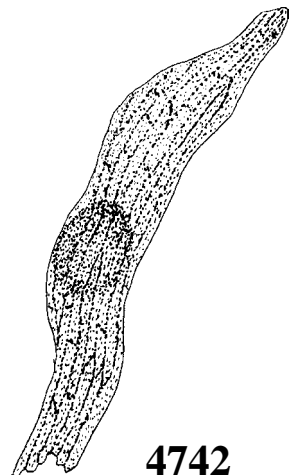
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polar territories, peatbogs, mossy swamps, moors; in all Carpathian lowland and montane zones.

**4748. *Corallorhiza trifida*** Châtel, *C. innata* R. Br. — Perennial, stem 7-30 cm high, leafless, scaly below, flower spike poor, flowers minute, greenish-yellow, reddish at margin. **Seeds spherical or slight ellipsoid in external, longitudinal, hyaline, transparent testa, cells distinct, 0.2-0.5 x 0.1 mm. Testa surface slight lustrous, colourless in upper part, lower part yellowish-white, seeds yellowish. 2n = 42.** Native to circumpolar territories, leafy and coniferous woods and shrubberies on moister stands; in all Carpathian upland and montane zones.

## 176. SPARGANIACEAE

**4749. *Sparganium emersum*** Rehmann, *S. simplex* Huds. — Perennial, 20-60 cm high, erect, protrudent above water level, leaves above this level upright (subsp. *emersum*). **Fruits achenes, ± ellipsoid, obpyramidal, but angles sometimes softened due to crowding, upper part dome-shaped, persistent style base forming a beak, lower part pyramidal to narrowly obconic, usually with 3-4 persistent sepals attached at base and ending at shoulder appressed to edges, 5-6 x 3.4-4 mm. Surface indurate, smooth, lustrous, ± wrinkled, dull, brown. 2n = 30.** Native to circumpolar territories, pond and water ditch margins, slow running, clear and cool waters, on alkali, but not calcareous, muddy soils; throughout the Carpathians.

**4750. *Sparganium emersum*** subsp. *fluitans* (Gren. et Godr.) Arcang., *S. longissimum* (Fries) Fritsch — Perennial, stems feeble, with feeble leaves, up to 1 m long and 8-10 mm wide, floating on still water. **Fruits achenes, ellipsoid, usually with a distinct shoulder between upper and lower part, with long beak on apex, usually with 3-4 persistent sepals attached at base and ending at shoulder ± appressed to edges, 4.2-4.6 x 1.9-2.3 mm. Surface indurate, smooth, lustrous, dull, light brown to brown, often grading to darker brown at apex.** In clean and cool waters. Its occurrence in the Carpathians still known insufficiently.

**4751. *Sparganium erectum*** L., *S. ramosum* Huds. — Perennial, in swamps or waters rhizome creeping, stem stiff, erect, 30-150 cm high, stout, branched above, inflorescence ramified. **Fruits achenes, obpyramidal, but angles sometimes softened due to**

**crowding, round to angled in cross section, upper part flattish, (subsp. *erectum*) or roundish (subsp. *oocarpum* Domin), persistent style base forming a beak, lower part pyramidal to narrowly obconical, sometimes ridged, usually with 3-4 persistent sepals attached at base and ending at shoulder ± appressed to edges, 6-9 x 4.5-5.2 mm. Surface hard and thick at maturity, smooth, dull, dark-brown. 2n = 30.** Native to Eurasia, stagnant, shallow waters, pond margins, rare in reed swamps; in all Carpathian territories.

**4752. *Sparganium natans*** L., *S. minimum* Wallr. — Perennial, stem floating on water-level, 10-30 cm long, with 4-9 articles, rarely erect. **Fruits achenes, ellipsoid or obovoid, with a distinct shoulder between upper and lower part, upper part smaller and darker, with long beak on apex, usually with 3-4 persistent sepals attached at base and ending at shoulder ± appressed to edges, 4-4.5 x 1.3-1.5 mm. Surface hard and thick at maturity, veinous, dull, lower part punctulate, pale-brown. 2n = 30.** Native to circumpolar territories, water-ditch banks, ponds and lakes, peatbogs, in shallow waters with acid, sandy bottoms; in all Carpathian regions.

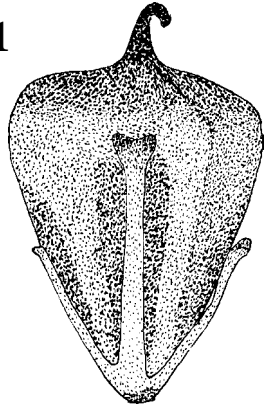
**4753. *Sparganium oocarpum*** (Čelak.) Fritsch, *S. erectum* subsp. *oocarpum* (Čelak.) Domin — Perennial, species similar to *S. erectum* subsp. *erectum*, **with uniformly light brown, ovoid to obpyramidal achenes, 5-8 x 4-5 mm, it is only partly fertile and may be the hybrid of *S. erectum* subsp. *erectum* x *neglectum*.** Native mainly to southeastern Europe.

## 177. TYPHACEAE

**4754. *Typha angustifolia*** L. — Perennial, stem stiff, erect, 1-3 m high, leaf blade 4-6 mm wide, dark-green, female inflorescence cylindric, dark-brown, 8-20 cm long. **Fruits achenes, fertile stalks long dense hairy, with seed and style 3-5 mm long, stigma on top brown and roughen, own seed c. in the middle, small, ellipsoid, 1-1.2 x 0.2-0.3 mm. Surface of seed dull, brown. 2n = 30.** Native to circumpolar territories, muddy banks of stagnant and slow running waters, reed swamps, warmed, eutrophic, non-calcareous waters with muddy bottoms; in all Carpathian regions.

**4755. *Typha australis*** Schumacher, *T. angustata* Bory et Chaub. — Perennial, stems up to 3 m high, robust, leaf-sheaths usually open at throat, male and female, inflorescence parts postponed by 1-6 cm on

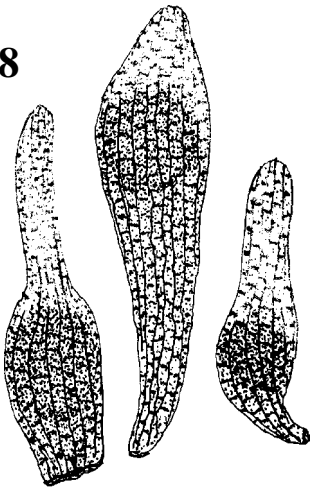
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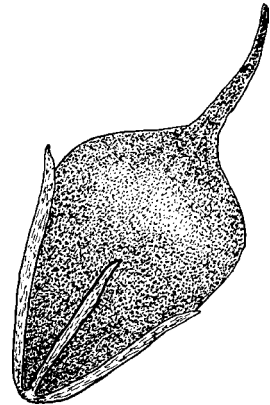
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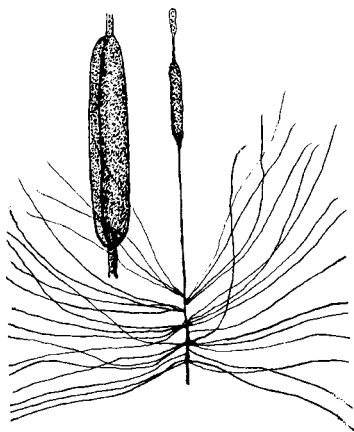
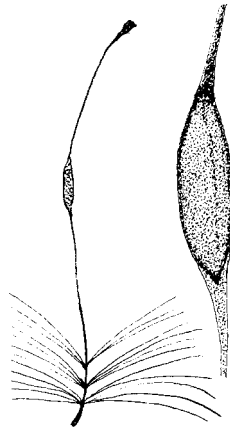
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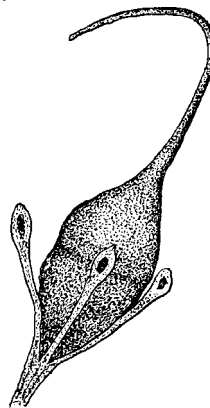


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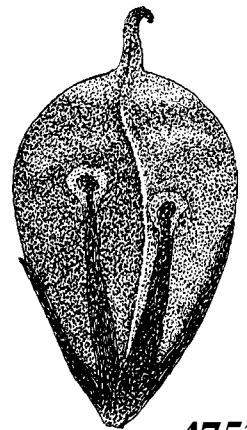


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4753



the same stem. **Fruits achenes, oblong-cylindric, with longitudinal furrow on ventral side, tuft (coma) of cottony hairs at one end and style at other one, 1.8-2.2 x 0.2-0.3 mm. Surface dull, brown. 2n = 30.** Native to southern Europe, river-banks, water channels in warmer areas. Ro, Uk.

**4756. *Typha latifolia* L.** — Perennial, stems stiff, erect, 1-2.5 m high, stout, roundish, ♀ inflorescences, 8-20 cm long, 18-30 mm in diam., dark-brown. **Fruits achenes, fertile stalk with seed, style and stigma 4-6 mm long, stalk on bottom hairy, seeds ellipsoid, dull, brown, stigma shovel, brown, 1.3-1.5 x 0.2-0.3 mm. 2n = 30.** Native to circumpolar, territories, littoral reed swamps, lowland wet woods, eutrophic up to 2 m deep waters with muddy bottoms; throughout the Carpathians.

**4757. *Typha laxmannii* Lepech., *T. stenophylla* Fisch et C. A. Mey.** — Perennial, stem 80-120 cm high, thin, erect, female inflorescences shortly cylindric, 3-5 cm long, dark-brown. **Fruits achenes, fertile stalk with seed, style and stigma 4-6 mm long, stalk bottom hairy, seed in the middle, stigma shovel, own seed undulate ellipsoid, situated between stalk and style, dull, brown, 1.1-1.4 x 0.2-0.3 mm. 2n = 30.** Native to Eurasia, banks of stagnant waters, rare in Hu, Mo, Ro, Sk, Uk.

**4758. *Typha minima* Funck ex Hoppe** — Perennial, stem 30-75 cm high, thin, erect, below covered with sheaths, leafless above, female inflorescence 15-45 mm long. **Fruits achenes, fertile stalk 4-6 mm long, bottom part dense long-hairy, hair ends shovel rough, brown, own seed at the end of stalk (style), ellipsoid, longitudinal faint striate, dull, brown, 0.7-0.9 x c. 0.3 mm.** Native to Eurasia, banks of slow flowing rivers. Hu, Ro, Sk, Uk.

**4759. *Typha shuttleworthii* W. D. J. Koch et Sond.** — Perennial, stem stout, 70-120 cm high, erect, female inflorescence brown in youth, silverish-grey when mature, 5-15 cm long. **Fruits achenes, fertile stalk, style and stigma 4-6 mm long, stalk bottom hairy, seed prolonged, ellipsoid, lustreless, brown, 1.3-1.7 x 0.35-0.45 mm. 2n = 30.** Native to Europe, still, cold, oligothropic waters with non-calcareous bottoms. Hu, Ro, Sk, Uk.

## 178. ARACEAE

**4760. *Acorus calamus* L.** — Perennial, aromatic plant, stems erect, 3-angular, 50-150 cm high, without stalks, leaves linear, 20-90 cm long, sword-shaped. **Seeds**

**wrinkly cylinder, apex with cap, bottom truncate, 3.3-4 x 1.9-2.1 mm. Surface lustreless, reddish-brown, cap pale-brown. 2n = 24, 36, 44.** Native to subtropical Asia; in the Carpathians cultivated as a medicinal plant in the past, naturalized though with sterile fruits.

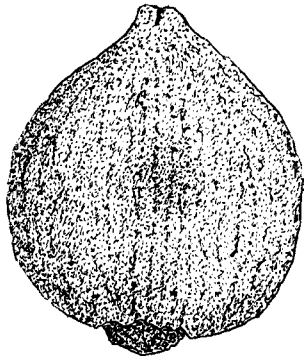
**4761. *Calla palustris* L.** — Perennial, rhizome creeping, leaves heart-shaped, shining, 12 x 4-11 cm, peduncle as long as leaves, spathe greenish, 1-3 x 1.2 cm. **Seeds cylindric, roundish-truncate at both ends, transversal section rounded, ventral side with longitudinal rib, 3-3.2 x 1.4-1.6 mm. Surface longitudinal striate, upper half foveolate, bottom half smooth, lustreless, brown. 2n = 72.** Native to circumpolar territories, alder swamps, reed beds, muddy ditches and ponds. Br, Hu, Pl, Ro, Sk, Uk.

**4762. *Arum alpinum* Schott et Kotschy, *A. maculatum* L., *A. orientale* auct. non M. Bieb.: Šourková** — Perennial, rhizome bulbous, leaf stalk 10-20 cm high, leaves arrow-shaped, 10-30 cm long, spathe 7-15 cm long, longish-lanceolate. **Seeds ± spherical, planoconvex, stout, ventral side with dark-brown navel, one or two lateral areas flat and smooth, the rest area distinct netted ribbed, 3.6-5 x 4-4.4 mm. Surface lustreless, pale-orange. 2n = 48.** Native to Eurasia, moist, shady woods and shrubberies. Hu, Mo, Pl, Ro, Sk, Uk.

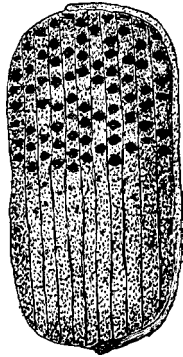
**4763. *Arum italicum* Mill., *A. italicum* subsp. *albispatham* (Stev. ex Ledeb.) Prime** — Perennial, plant 25-70 cm high, leaves appearing in autumn or early winter, lamina 15-30 cm, sagittate to hastate, fruiting spike 10-15 cm long. **Seeds oval, stout, apex blunt acute, 4.7-5.2 x 3.8-4.2 mm. Surface dense furrowed or reticulate-foveate, lustreless, brown or violetish-brown. 2n = 84.** Native to southwestern Europe, hedges and disturbed grounds. Ro (?), Uk.

**4764. *Arum orientale* M. Bieb. subsp. *besseranum* Holub** — Perennial, stems 10-40 cm high, leaves 10-30 cm long, sagittate, petiole 15-20 cm long, fruiting spike c. 7 cm. **Seeds ± spherical, stout, apex with small beak, bottom with large hilum, 4.5-5 x 4-4.5 mm. Surface foveolate, dull, pale- to reddish-brown. 2n = 48.** Native to Eurasia, shady places of the all Carpathian territories.

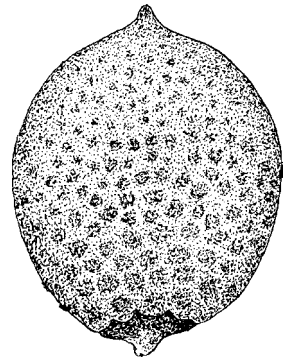
**4765. *Dracunculus vulgaris* Schott, *Arum dracunculus* L.** — Perennial, plant up to 100 cm high, leaves ± reniform in outline, berry orange-red. **Seeds spherical, stout, compressed from one side, apex blunt**



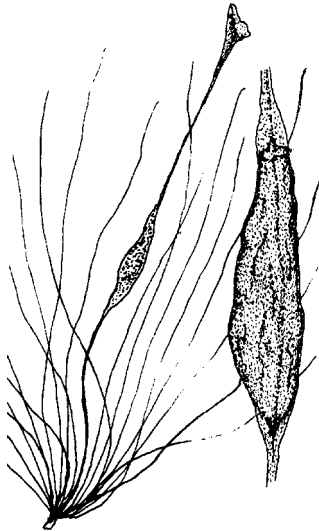
4765



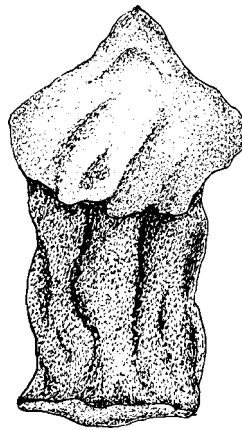
4761



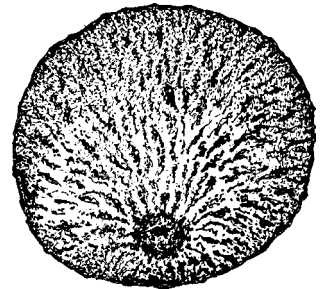
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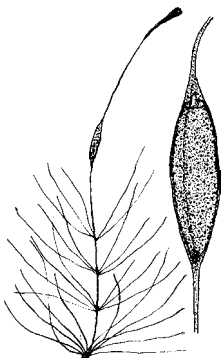
4757



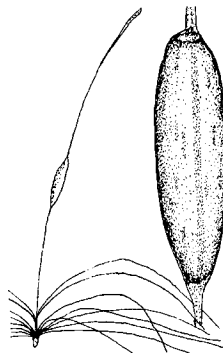
4760



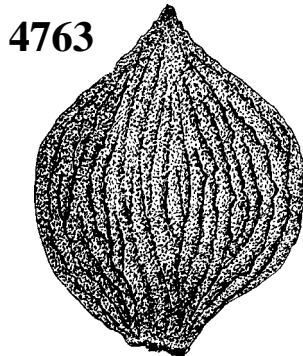
4762



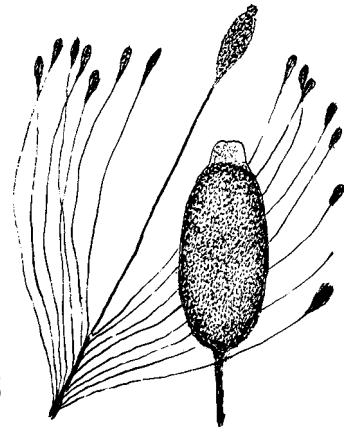
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4763



4758

acute, 5-6 x 4-4.5 mm. Surface dense striate, faint lustrous, pale- to dark-brown.  $2n = 32$ . Native to the eastern and central Mediterranean regions, woods and scrubs; in the Carpathians very rarely cultivated as curiosity, occasionally naturalized.

#### 179. LEMNACEAE

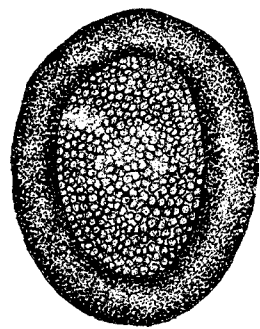
**4766. *Lemna gibba* L.** — Perennial, leaves floating on water, roundish or obovoidal, 2-5 mm in diam., underneath swollen, with one unbranched root. **Seeds ellipsoid, bordered around, with broad hem, central part grained, 0.3-0.4 x c. 0.3 mm. Surface glabrous, slight lustrous, dark-brown.  $2n = 50, 60, 64, 80$ .** Native to circumpolar territories, now a cosmopolitan, in the zone of stagnant water floating vegetation; in all Carpathian territories.

**4767. *Lemna minor* L.** — Perennial, leaves 1.5-5 mm long, floating on water-surface, green, underneath

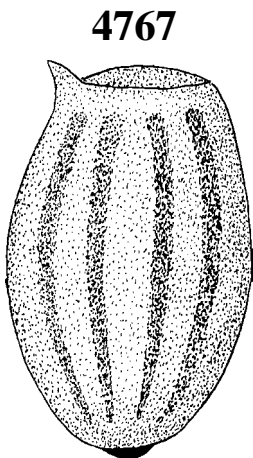
sometimes red, flat, inflated, with one root. **Seeds barrel-shaped, apex truncate with small ear, bottom with hilum, 0.7-0.9 x 0.45-0.55 mm. Surface glabrous, lustreless, with few darker stripes.  $2n = 40, 50$ .** Native to circumpolar zones, stagnant-water floating vegetation, surfaces of ponds and ditches, or slow flowing waters, often in vast colonies; in all Carpathian lowland and montane zones.

**4768. *Lemna trisulca* L.** — Perennial, leaves oblong to narrowly ovoid, 5-15 mm long, 3-veinous, ramified, non-flowering floating under, flowering above water surface. **Seeds semispherical or ellipsoid with 2 ellipsoid hilums, 1-1.2 x 0.7-0.8 mm. Surface smooth, lustreless, yellowish or pale-brown, hilums dark-brown.  $2n = 44$ .** Native to circumpolar regions, zones of stagnant-water floating vegetation, rich in organic material; throughout the Carpathians.

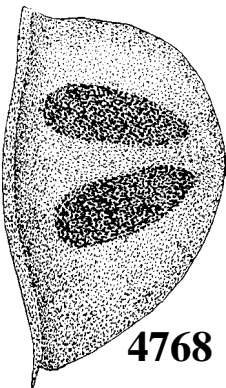




4766



4767



4768

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## X KEY TO FAMILIES OF SPERMATOPHYTA

### A. GYMNOSPERMAE

1. Cycadaceae
2. Ginkgoaceae
3. Taxaceae
4. Pinaceae
5. Taxodiaceae
6. Cupressaceae
7. Ephedraceae

### B. ANGIOSPERMAE

8. Magnoliaceae
9. Schizandraceae
10. Calycanthaceae
11. Lauraceae
12. Juglandaceae
13. Cercidiphyllaceae
14. Myricaceae
15. Betulaceae
16. Corylaceae
17. Fagaceae
18. Platanaceae
19. Salicaceae
20. Moraceae
21. Ulmaceae
22. Urticaceae
23. Cannabaceae
24. Phytolaccaceae
25. Molluginaceae
26. Aizoaceae
27. Tetragoniaceae
28. Nyctaginaceae
29. Opuntiaceae
30. Portulacaceae
31. Basellaceae
32. Caryophyllaceae
33. Plumbaginaceae
34. Chenopodiaceae
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